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Making Cold-Drawn Screw and Shaft Stock

Cold-Drawing of Bessemer Steel—Cleaning and Working the Stock—Machine Designed to Curtail Waste of Material

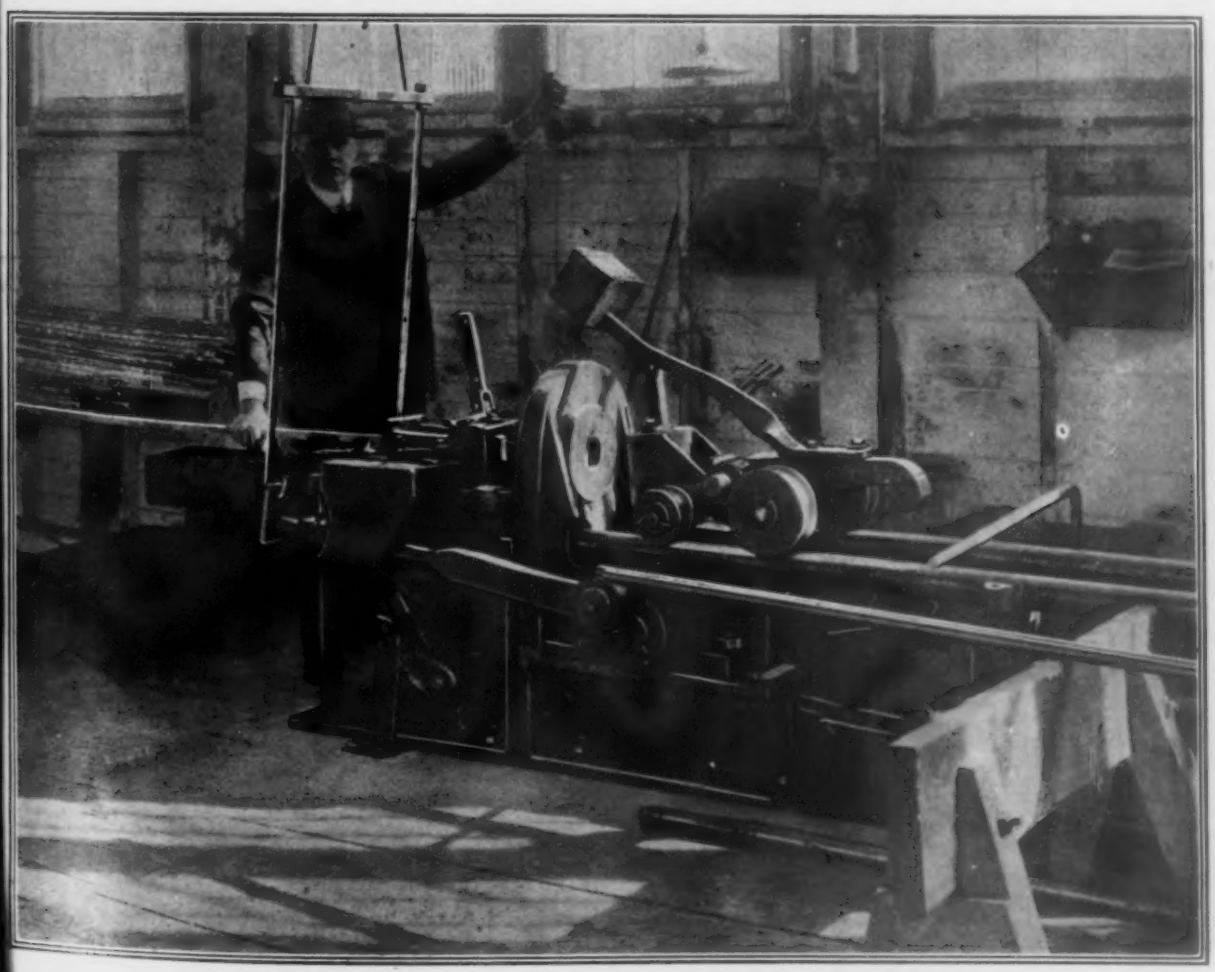
BY ROBERT I. CLEGG

THE factory of the New England Drawn Steel Co. is at Mansfield, Mass., centrally located on the main line of the New York, New Haven & Hartford Railroad as regards Boston, Providence, New Bedford, Fall River and Worcester, cities using substantial amounts of the material such as is produced at this plant.

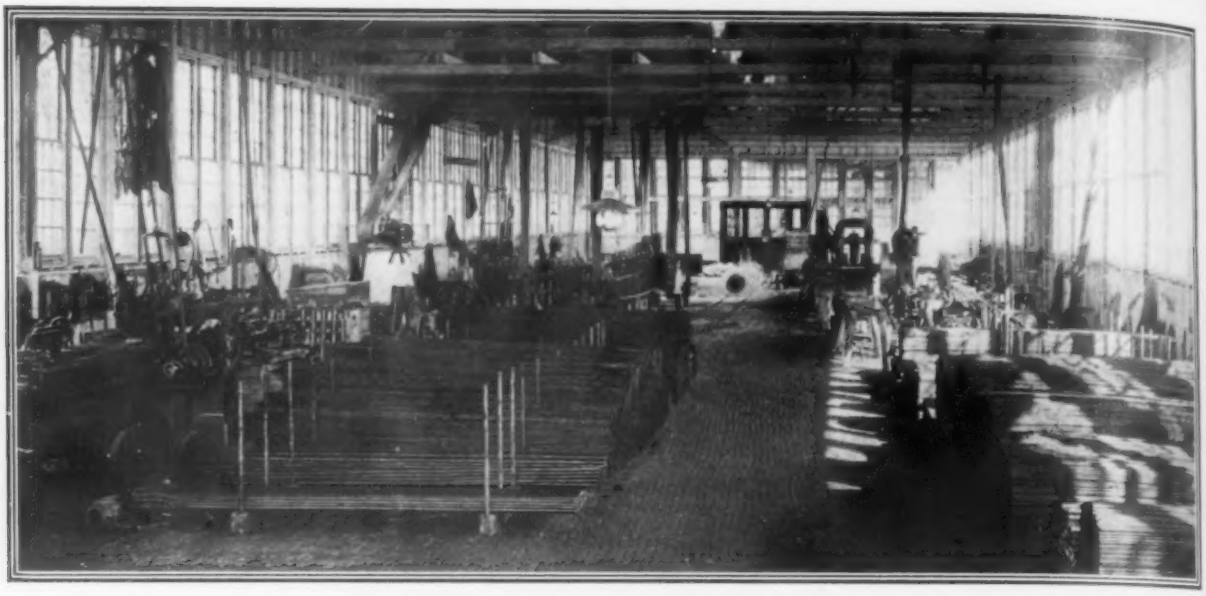
Organized in October, 1916, the factory was in readiness to begin a working schedule of operations on Memorial Day, 1917. The product is 3/16 to 1½-in. shafting and screw stock, rounds, hexagons and other shapes in cold-drawn free-cutting material. This is a uniform grade of Bessemer steel made from the company's own special analyses and specifications. The steel is hot-rolled for the company, which then draws the stock accurately to size while cold, the surface getting a planished finish during the rotary straightening of the larger dimensioned work.

Plans for an extension of the plant and a considerable elaboration of its product are under consideration, including an enlargement of the scope of the work up to 2½ in. in diameter in turned and ground material, a product suitable in every way for what may be termed a piston-rod class of work.

Handling of alloy steels is not unfamiliar to the experts of the company, and this in turn leads naturally to commercially engaging in the heat treatment of metals, a task temporarily retarded during the war but on which progress has been made. In



Draw Bench of the Company's Design for Large Work, 11/16 to 1½ in.



Interior View of the Factory as Seen from the Toolroom

fact, for aeroplane and Liberty motors there has been supplied cold-drawn stock from this plant in chrome-vanadium and in chrome-nickel alloys.

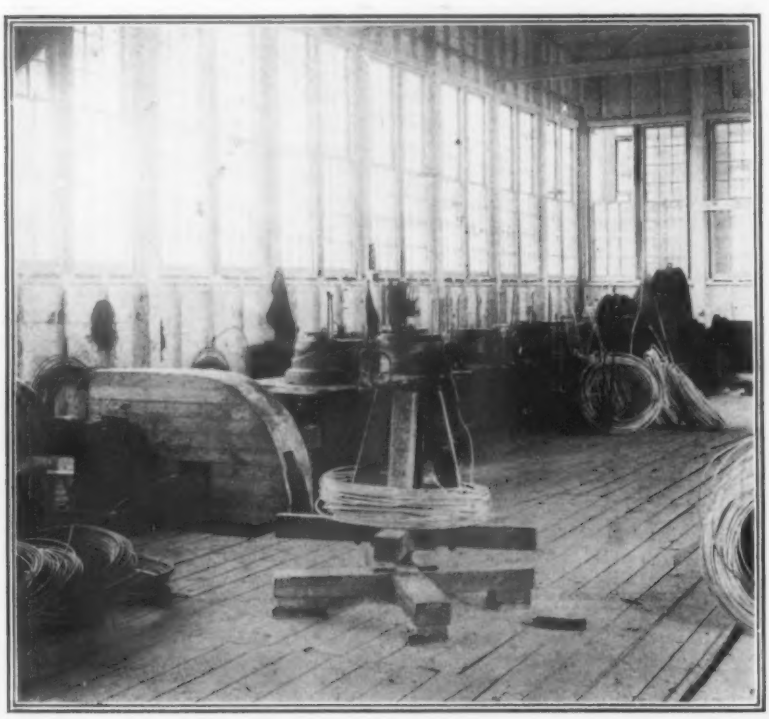
Of the regular material furnished by the company to the Government on its standard specifications and on war work there has been the usual mild steel stock for 1-lb. shells, for the thrown type of trench bombs, for cartridge containers, etc.

As at present laid out and in operation, the plant comprises a main building, 250 x 50 ft. At the end of this structure there is a cleaning house, 50 x 50 ft. In the rear of the main building and cleaning house there is a power house, a storehouse, and an office building. The factory and cleaning house have 16 ft. head room spanned by a light girder capable of carrying a monorail of 4 tons capacity.

The site containing 8½ acres, there is plenty of room for expansion. A loading platform extends the whole length of the structure.

Power is purchased from a hydro-electric company and is in the form of a 550 volt 3-phase alternating current supplying about 350 hp. Motor equipment includes one 75 hp., four 50 hp., one 25 hp., four 10 hp., one 7½ hp. and one 5 hp. A 250-hp. boiler is used for heating purposes.

Much of the machinery has been developed by the owners themselves. The equipment includes a drawbench designed by the company's superintendent; two Standard Engineering pointing machines; two roll straighteners built by the company to its own design; one V. & O. shear for cutting the larger work; one Warner & Swasey automatic cutting-off lathe; one Higley cold saw; two rotary straighteners for rounds, these machines built by the owner; one rotary straightener for shapes, a machine built by Brightman Mfg. Co.; one press straightener or bumper built by the owner; one 2-block "bull" frame for ¾-in. and small stock, a machine built by the Morgan Construction Co.; one 4-block Morgan wire bench; four B. T. Shuster straightening and cutting machines for rounds, direct from coil, ⅝-in. and smaller diameters; and one Shuster straightening and cutting machine for shapes. A toolroom and diemaking equipment is included.



A Set of Wire Blocks, or "Bull" Frames for Drawing ⅝-in. Stock and Smaller Sizes

Cleaning apparatus comprises the necessary tanks and vats, with hoists for immersing the rod stock in the pickle and for washing. These agitating tanks of acid are provided with means for securing a circulation of the pickle, thus to get fullest advantage from the acid and also lessen the time required in the series of operations.

On single turn the plant has handled 732 tons of product in a month. However, it was designed by making use of the necessary shifts to make about 1000 tons monthly. From 2000 to 2500 tons of stock are on hand at a time.

Among especial points of technical interest it is noted that the draw plates and dies are not hardened. A suitable grade of steel is made for this purpose that when compacted at the opening in the die or draw plate stands up well against the wear of the rod producing process.

The blocks in the rotary straightening machine are cast iron. A steel block, no matter how hardened and lapped to shape and finish, does not

A Straightening and Cutting Department

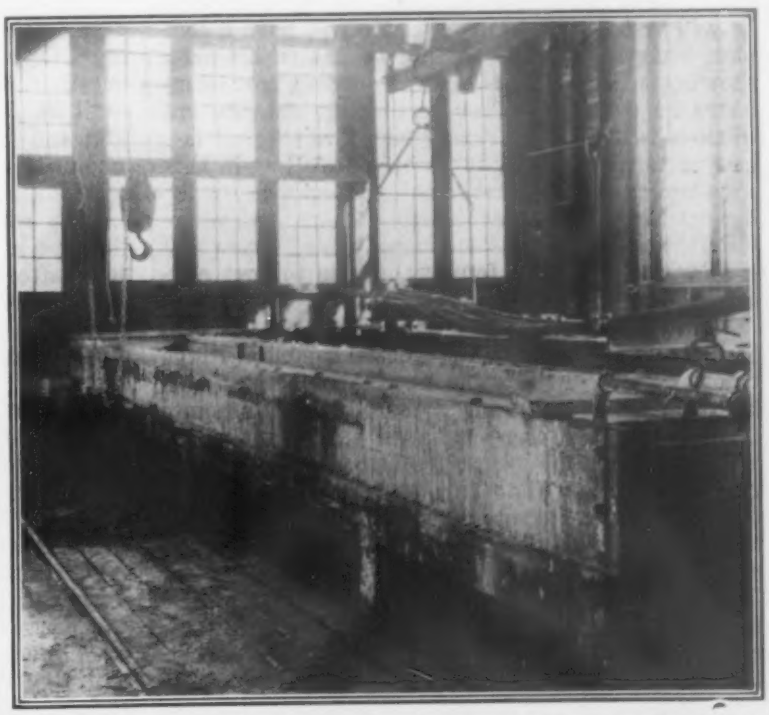
produce really satisfactory results for continued periods of time, sooner or later the steel block roughing up and then of course doing the very opposite of what it was intended to do.

Draw bench work can easily be made very wasteful of the material passing through the plant. Stock must somehow be held as in a vise while reducing operations are begun in various shaping and sizing machines, and this gripping of the work may and usually does seriously mar and disfigure the stock surface wherever the grip takes hold. It is found entirely practicable in this plant to hold the waste stock down to less than 1½ per cent of the finished product.

In a length of from 30 to 36 ft. not over 2 in. waste is required for even the heaviest stock to be securely gripped by the draw bench tongs. This may not seem practicable because the stock passes through a die or draw plate supported by and against a "dead man" and must have a projecting end extending far enough to be gripped by the draw bench tongs. If the end of the stock is swaged down to pass through the draw plate and stretch far enough to enter the tongs, all this extension goes to waste because it is smaller in size than the finished stock is intended to be when reduced by the draw plate under the pull of the working strain.

One of the illustrations shows a draw bench for the making of larger work 11/16 to 1½ in. diameter. Superintendent Snyder has a rod in position at the left of the picture in readiness for drawing. The crank and connecting rod on the reader's side of the machine is matched by another crank and connecting rod at the opposite and further end of the crank shaft extending through the machines. The two hanging rods act together when started as is being done by Mr. Snyder and they lift into action the two connecting rods as shown. These rods take hold of the sliding platform resting on the bed of the machine at the left. This slide has a gripping or clamping mechanism operated by the lever that is pointing vertically toward the operator's outstretched left arm. A short length of the hot rolled raw stock extends beyond the clamp in the slide. When the connecting rods give the slide a vigorous pull toward the right the end of the stock is forcibly pushed through the die or draw plate, where it is gripped by the bench tongs and drawn onward. This does away entirely with swaging a wasteful length of the stock and yet provides ample length for the draw bench to get a good grip on the work.

The officers of the company are W. B. McSkimmon, president; Charles F. Loughead, vice-president; Clifford Lyall, treasurer, and H. W. Snyder, superintendent. Mr. Snyder was superintendent for six years with Bliss & Laughlin, Inc., Harvey and Chicago, Ill.; two years with the Illinois Steel Co., South Chicago, Ill.; eight years with the Columbia Steel Shafting Co., Pittsburgh; was six years assistant superintendent of machinery with the Pittsburgh Plate Glass Co., Ford City, Pa., then for a short time with the Aetna Foundry & Machine Co., Warren, Ohio, leaving this latter company at the organization of the New England Drawn Steel Co.



A Corner of the Cleaning House. Hoists provide for immersing the stock in the pickle and for washing

The Pattern Shop Superintendent

His Place in Foundry Practice as an Executive—Checks on Progress of Work —Routing Work Through the Shop

BY PAUL R. RAMP*

THE pattern-shop superintendent employed by a company producing castings for the trade is a very important person, and a great deal depends upon his ability as a mechanic and an executive as to whether the company's casting business will be a brilliant success or a failure. If the product of his company consists of intricate castings that must be turned out in large quantities and at a reasonable cost, and at the same time pass a very rigid inspection, he must be alive and "on the job" every minute. It is true he can secure a great deal of valuable information from the foundry, but the successful pattern shop man is always working about two laps ahead of the foundrymen. He is the fellow who is generally responsible for the numerous little kinks and short-cuts and safeguards that make for the foundrymen and the company a reputation for quality and production.

A Good Critic of Molding

There has always been a little prejudice on the part of the foundrymen against the patternshop man that appears to permit him to deprecate the patternmaker's ideas of molding; but nevertheless, some of the best things in to-day's foundry practice have sprung out of the patternshop, so we believe that the patternshop superintendent should receive credit for all the good things he does. In spite of the fact, as some foundrymen will say, "he never made a mold in his life," by his observation of foundry practice from a little different angle than the foundryman he is able to bring out many good things.

Now this is only true with the patternshop superintendent who is a mechanic and a good executive. There are several things that a man of this type will always observe, and you can invariably trace the cause of his success to them. In the first place, he will systematize his work. He will have a complete record of every job that he has in his shop, showing when he received the order, how many hours he expected to consume doing the job, and when it was finished, regardless of whether it is a new pattern or repairs to an old one. He will have a system of checking every pattern and every molding machine that leaves his department, and where the man of this kind is in charge, we all know that it is very seldom the foundry is able to "get anything on" the patternshop.

The competent patternmaker does not have to have the foundry make a half dozen sample castings before he is able to determine what is wrong with his pattern. We agree that there are a few points that make the checking up more simple by having a sample casting made, but when the foundry department is obliged to furnish numerous castings to enable the patternmaker to make changes from time to time, it is safe to assume that we have the wrong man on the job.

The successful pattern man will take up each order as he receives it and estimate the hours required to do the work and the material necessary. He will then consult the man in the foundry as to the method he wants to work after in molding it. This enables him to produce a pattern that will be satisfactory to the foundry, and should he have any ideas that do not coincide with the foundryman, he will at this time have an opportunity to convince the foundryman that he is wrong, and if Mr. Foundryman is wise enough to know that it pays to listen to what the other man has to offer, he will profit by the patternman's suggestion.

Too Many Bosses Spoil a Good Pattern Man

There is one thing that must be borne in mind at all times, which is, while the patternshop superintendent is the servant of the entire works and serves the engineering department, the general superintendent, and looks after the wants of the foundry foremen, core boss, and in fact helps everybody that has anything to do with production, it is very important to the success of the company, as well as the man himself, that he receives his orders through one channel.

The best executive in the world will become a hopeless failure if he is obliged to manage his department according to the ideas of several different persons. This is true in any department, but we believe it is a more serious mistake and a more expensive mistake when it is applied to the pattern department, and we usually find the successful and competent shop superintendent absolutely refusing to take orders from more than one man. He cannot be hampered or bothered as much as probably other department heads, because his work as it comes to his department is in a stage where original and new ideas can be incorporated without disorganizing anything. He is the same as the inventor in this respect. For this reason the fewer bosses he has the more he will accomplish.

It is indeed a sad sight to see the head of this department chased from pillar to post by three or four different people in authority, and it is only a question of time, if subjected to this treatment, until he finds himself unable to handle the situation and is considered a failure by the very ones who no doubt are responsible for him not being able to produce results.

The wideawake pattern superintendent will be the first man to check over the first casting from a new pattern. He will want to know how his cores fit, how much fins he has at certain points, how the shrinkage checks up with his pattern; if it is a molding machine job he will get into more details and know all about the various troubles long before the regular checker has laid out the casting for stock, etc.

The pattern man who waits for the layout department not under his supervision to report before he tries to find the variations in his first casting has no business to be in charge of a patternshop. He is not interested in his work and will not make dividends for his company.

There is quite a difference in men in this capacity. For instance, when a casting is not coming out according to the drawing, there is one pattern superintendent that will spend a day or two trying to establish an alibi and unload the mistake on some-

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body else and probably spend about 1 hr. checking up his own work. This man is expensive at any price. There is another pattern superintendent who under the same circumstances will get right after his drawing and re-check his pattern and core boxes, and if they are wrong will work the boys overtime correcting them. If they are correct he will get after the guilty party and make him admit his mistake. The fact that he has gone into his own work thoroughly enables him to drive his argument home in a very short time, which results in immediate action being taken by those responsible for the loss.

Keeping Tab on Condition of Shop Equipment

The head of the pattern shop should keep a complete record of all patterns made for shop castings and see to it that every one of these patterns is assigned a number and that the number is placed on the pattern. This is one thing that is often neglected, and many dollars are wasted hunting up and remaking these patterns.

He should have a system of checking the condition of the working patterns and core boxes. This could be arranged with an index card system, giving each pattern and set of core boxes a certain date for checking over to ascertain whether or not the patterns or boxes have become worn, abused or warped out of shape so that they will not produce a perfect casting. In a shop making large production, more defective castings are produced because a careful checking has not been made on the condition of the working patterns than for any other pattern reason. The competent pattern shop superintendent appreciates the fact that his core boxes and his patterns will be worn off at the edges, his core boxes made larger from the continual wearing of the sand, and he makes this check one of the most important details of his work. The foundry can be a great deal of help to the man in the pattern shop in reducing the amount of repair work which is the result of patterns being abused by the molders. We are sorry to say that very often he does not get the co-operation he should have in this respect.

There is no excuse for a patternshop not being kept in a neat and clean condition, and it is advisable to check up the work very carefully that is turned out by a pattern shop man who allows his department to be littered with rubbish and dirt. The most effective plan of patternshop organization is for the superintendent of this department to be in charge of all patternmaking, the pattern storage and all molding machine equipment. It should be up to him to see that molding machines are in good condition, that working parts are kept up to a standard, and that all exposed parts of the machines are inclosed. He should have a complete list of the machines in the plant, their size, their "make," what they are being used for, and the number idle. This will enable him to keep a daily check on this equipment.

In a shop where there is a production of locomotive cylinders, pump cylinders and other similar castings, a large number of gages for assembling molds, rubbing down cores and correctly locating cores are used. It is very important that the pattern department keep these gages in first-class condition, and they should be included in the system of checking working patterns, as a great deal of loss has been experienced simply because those used on some jobs have been allowed to become worn.

System in the Pattern Shop

Very often one patternshop superintendent is expected to furnish all the pattern work for several foundries. Where this is the case he should divide his department, assigning a certain number of workmen for foundry A, and the required number for the work to be used in foundry B, and the same thing for foundry C. His assistant in charge of the work for any one of these foundries should be given to understand that he is expected to get all of his work out with the men allotted to him, and that he is not to borrow or lend from the other men that are working for the other foundries without the permission of the patternshop superintendent.

It is often the case, we believe, that the patternshop superintendent is not given credit for the many things that he does to make the foundry business a success. The right kind of a man, the one that can qualify to hold an important position of this kind, is very valuable to his company.

Italy's Demand for Ore and Pig Iron

The requirements of the Italian steel industry for foreign iron ore and pig iron are set forth in a memorial of the Italian Metallurgical Association republished by the Bureau of Foreign and Domestic Commerce from the Weekly Bulletin of the Canadian Department of Trade and Commerce. The memorial points out that the needs of the metallurgical industry of Italy can not be definitely satisfied by the limited supplies of iron ore existing in the country, the inference therefore being that recourse must be had to foreign sources for the necessary raw and semi-manufactured materials.

Prior to the war the iron mined in Italy came almost altogether from the Island of Elba and from there was taken to the blast furnaces at Portoferraio, Piombino, and Bagnoli. Thus, for example, in 1914, of the total tonnage produced in the Kingdom, amounting to 706,246 tons, Elba yielded at least 649,561 tons. The mines of Valdaspra, in the Province of Grosseto (central Italy), yielded 36,000 tons, while the remainder was derived from the mines of Inglesiente (Sardinia) and Bergamsco (Province of Bergamo). Between 1909 and 1914, 2,500,000 tons of ore were mined in Elba and the production during the war was considerably increased. For example, in 1916 there were extracted from the whole of Italy 942,244 tons, and in 1917 almost 1,000,000 tons, the greater part in each year being of Elban origin. From now on, writes the *Finanza Italiana*, the Elba group can not furnish large quantities under convenient conditions, as it will now be necessary to exploit the veins under the sea, with resulting greater costs.

The war, however, has stimulated researches for other ore deposits in Italy. Although in 1909 there was known to be high-grade iron ore in the Val di Cogne (near the French frontier), estimated at 6,000,000 tons, its exploitation was only recently begun by the well-known Ansaldo firm, which has installed electric blast furnaces modeled after Swedish types. Moreover, in the Nurra district of Sardinia the surveys made during the war have revealed the existence of about 6,000 000 tons of good iron ore. It is hoped, in fact, to utilize 150,000 to 200,000 tons a year from this source.

The following figures give the present and estimated deposits of iron ore in Italy: Traverselle, 1,000,000 tons; Cogne, 5,000,000 tons; Central Italy, 2,000,000 tons; Sardinia, 6,000,000 tons; Val Brembana, 20,000 tons; total, 14,020 000 tons.

If the Italian manufacture of pig iron only maintains its production (about 400,000 tons annually), it is estimated that 700,000 tons of ore will be exhausted. As a remedial measure, it has been suggested that greater quantities of scrap iron and steel will have to be imported; the Metallurgical Association says at least 420,000 tons a year. In other quarters, it is believed a better policy to bring the ore from abroad and make the pig iron locally.

But pig iron will also be and is in demand, and if the industrial program that Italy is drawing up is taken as a criterion, even larger quantities of pig iron will be required than before or during the war.

EMERGENCY WAR FOUNDRY

How Special Conditions in the War Area Were Met With Oil-Fired Furnaces

How an emergency foundry was constructed in connection with repair work in France was related by Capt. A. E. Plant, on active service with the British Army, in a paper, "The Use of Oil in the Foundry in Urgent Exceptional Circumstances," presented before the Institute on Metals (British) last September. An abstract follows:

It was decided to install a Charlier oil furnace, and one with a capacity of 5 cwt. was bought locally and installed. The fuel recommended was a tar oil, which was obtainable at about 30 francs ($6) per barrel. There was no burner on this furnace; a ¼ in. gas pipe, led along the top of the air-blast pipe, was bent over at right angles at the end, and was connected to a receiver; this, in turn, being connected to an oil tank mounted on a platform about 12 ft. from the ground. The oil issued in a thin stream at the end of the blast pipe, and the force of the blast converted it into a spray. The air blast showed a pressure of 9½ in., water gage.

When the demand for the next supply of this tar oil was made, the vendors put up the price considerably. In facing this problem it struck the writer that it might be possible to utilize a considerable quantity of waste oil and grease that had accumulated from the cleaning out of the engines and gear-boxes of cars and lorries that were undergoing repairs in the depot. Arrangements were according made to mix, clarify and filter this oil, which was found quite easy to use. In fact, it gave better results than did the tar oil and, for over two and a half years, nothing else but waste oil was used. The oil consumption with a charge of 350 lb. heavy gun-metal scrap, which was the usual charge, averaged about 9½ gals. and the time taken (the furnace being hot at the start) one hour. This consumption is not very economical, perhaps, as it was not always possible to have the same operator at work, and the operators (soldiers) had never had any previous experience on this class of furnace.

The furnace was chiefly used for running down gun-metal borings from the machine shop, and gun metal and brass scrap; all metal, either new mixings or scrap, being first run into ingots. It is necessary to use plenty of flux to protect the surface of the molten metal from absorbing gases. Castings are not often made direct into the mold, but ingots are remelted in a crucible in a vertical oil-fired furnace. For melting metal for aluminum castings the furnace was most satisfactory, as the temperature could easily be controlled.

Vertical Oil-Fired Furnace

It was decided to build a vertical furnace to take crucibles up to 100 lb. and to use the same waste oil as fuel. The furnace was circular in design, the casing being made of cast iron and the lining of fire bricks. The blast pipe had a jet of 1½ in. diameter connected to it, and the jet entered the furnace at such an angle that the issuing flame struck the furnace wall at a tangent and a whirling motion was imparted. The vaporized oil entered the furnace just below the center of the crucible (not the bottom). The blast pipe was itself 2⅞ in. in diameter. Flames and hot waste gases, which exhausted through an opening at the bottom of the furnace, impinged directly on it, so that the blast entered the furnace at a high temperature. The fuel entered the blast pipe through a ⅜-in. steel pipe, just above the place where the hot exhaust gases struck it. Directly in front of the heated portion of the blast pipe was a cast-iron baffle plate, which deflected the flow of exhaust gases upward and gave the blast pipe in front of it the full benefit of all the waste heat.

The fuel oil was contained in a 15-gal. tank fitted with a hand air pump and a pressure gage. About 5 lb. of pressure was kept up. In between the fuel tank and the entrance of the oil to the blast pipe a brass receiver was fitted to fulfill several purposes. First, it was easily heated by a blow lamp on very cold days to make the oil run freely for starting up. Second, it regulated the supply of oil to the blast pipe in case the oil flow from fuel tank was a little sluggish, as it often is when very cold. Third, it acted as a final trap to catch any dirt or foreign matter in the fuel oil. Between the receiver and the fuel lead pipe to the furnace a small regulating cock was fitted. The pressure of air used was 9 in. (water gage). An electric motor driving a fan of 3000 r.p.m. was the source from which the air supply was derived.

An average time to melt 80-lb. gun metal ingots was 40 min., after the furnace had been heated up. When melting aluminum ingot an 80-lb. crucible took about 15 min., the furnace being hot initially. The essential points to watch in the use of waste oil are—freedom from dirt, water, or other foreign matter, and the fact that it must flow freely to the jet.

Kind of Castings Made

Castings in iron, gun metal, phosphor bronze, brass, and aluminum were produced in the same building, a portion of the floor being reserved for bronze and brass, as it was found that aluminum and iron castings can be successfully made on the same floor. Over a ton a month of new white metal was made for lining and making die castings for petrol engine bearings. The monthly average weight of castings produced varied from 5 to 8 tons, and the castings numbered from 1600 to 2500 being very varied in character and weighing from a pound to nearly a ton, according to the demands.

The work turned out comprised: Bushes in gun metal; cast iron Daimler water-jacketed cylinder heads; cast-iron water-jacketed induction pipes; aluminum pistons; cast-iron piston ring blocks, bearings, brackets, pipes and flanges in all metals; shop tools and jigs; tables for hydraulic pressures (average weight 18 cwt.), aluminum pulley wheels, and parts of radiators. Many more different kinds of castings were made, but this gives a fair idea of the work produced.

The chief points in favor of using oil fuel in the circumstances under which the work is done were as follows:

It is only necessary to have the furnace in operation about a quarter of an hour before the crucible and charge are introduced.

It often happens that the furnace is not required all day long, and it can be put in and out of operation very quickly.

Temperature control is easy and consistent.

Saving in transport of solid fuel.

Utilizing waste oil on the spot.

In the Charlier furnace, borings and scrap can be melted more easily and economically than in crucibles.

In regard to the waste oil, it should be noted that this oil cannot be used again for lubricating purposes without refining, owing to the fact that it contains quantities of finely divided carbon, mud and other impurities; therefore its use on the spot in the foundry is distinctly economical.

The Tractor and Thresher Department of the National Implement and Vehicle Association at a meeting held at the Auditorium Hotel, Chicago, on April 11, formally expressed its desire that the United States Department of Agriculture establish a bureau to conduct tractor tests to determine draw bar and belt power ratings and to furnish a certificate of findings on each machine tested. Under this plan a variety of tests proposed by the various state legislatures would prove unnecessary.

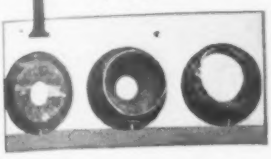
The E. W. Perry Machine Co., Youngstown, Ohio, is building a line of 15-in. tool room lathes of 6, 8 and 10-in. swing, containing some new features, patents for the lathe having been granted to Joseph Crawford, Jr., New York. The Perry Machine Co. has made shipments of three of these lathes to England, two to Cuba and one to Detroit.

The American Malleable Castings Association, 1900 Euclid Building, Cleveland, has received many requests for its booklet on malleable iron recently published and is sending the booklet free of charge upon request.

Application of the Sand-Blast*

Relationship Between Air Pressure and Abrasion — Apparatus Specialized for Economical Operation—Air Conditioning

BY H. D. GATES†



TO-DAY no foundry is considered completely equipped to turn out satisfactory castings most economically, without a sand-blast installation adapted to its particular work.

Where output is varied and tonnage sufficient to warrant, the greatest economy will be found in a separate unit for each class of work that it will handle with greatest rapidity at lowest labor cost, the whole laid out and adapted to the routing and handling system of the plant.

For the average jobbing foundry, however, where the work runs promiscuously from small to large and the daily output is not large enough to permit of such specialized equipment, no type of machine so effectually accommodates itself to all kinds of work as the high-pressure hose sand-blast.

The hose type machine was the first method of application of sand-blasting, and consists of a sealed container into which the sand or other abrasive is loaded, and by the direct air pressure driven through a hose of required length, the air and abrasive being discharged in combination through the opening of a small nozzle. As no expansion of the air takes place before discharge at the nozzle, the greatest velocity of the abrasive is obtained by this method, with corresponding effectiveness of abrading action. The high-pressure sand-blast is now recognized as the standard for general foundry use.

Effect of Air Pressure on Abrasive Action

While the travel of compressed air through a pipe or hose is approximately the same at all pressures above one atmosphere, the velocity of the abrasive after leaving the nozzle increases very rapidly as the air pressure is increased, with correspondingly greater blasting effectiveness. This permitted the use of small, easier handled hose and small nozzle, in place of the large, cumbersome hose and nozzle with a very decided saving in labor to the tonnage cleaned. Better operating conditions were obtained also through reduction of dust created by disintegration from the lesser volume of sand used. Some better understanding of this will be possible from the results of tests made. These show that the amount of sand blown at 30-lb. pressure to remove 1 lb. of metal from an iron bar was 3361 lb., while at 70-lb. pressure the required sand was but 2043 lb., or over 50 per cent more at the lower pressure, the same size nozzles being used in both instances. Of the reusable sand there is only 17.2 per cent difference in favor of the lower pressure.

The amount of metal removed per 100 cu. ft. free air per min. flowing was, at 30-lb. pressure, 0.1969 in., and at 70 lb., 0.4473 in., or nearly two and one-half times as much accomplished at the higher pressure with no increase in time and labor.

The amount of air consumed in sand-blast operation is governed entirely by the size of the nozzle opening and the pressure maintained; this feature is therefore one that should have the most careful consideration of the prospective sand-blast user.

Constant wear, varying with pressure and abrasive, is occasioned in the nozzle, as shown above, and a very little enlargement means considerable increase of air consumed and horsepower as well. For instance, a nozzle with ¼-in. opening flows 76 cu. ft. of free air per min. at 70 lb. pressure, as in the sand tests above, requiring 12.7 hp. to develop. Increase this opening 1/32 in., and the air flow increases to 85.5 ft., or 12.5 per cent, and horsepower requirement is 14.3. An enlargement of 1/16 in. increases the air flow to 118 cu. ft., or 16.5 per cent, with horsepower developed 19.9. And if the increase reaches ⅛ in. the air flow jumps to 171 cu. ft., or an increase of 125 per cent, while the horsepower developed rises to 28.6. If this wear, therefore, can be eliminated, obviously much power expense will be saved as well as constant pressure maintained.

The construction of the modern sand-blast room is sheet steel made dust-tight, with fresh air inlets around the sides near the base, the dust-laden air being carried off through a hood in the ceiling of the room by a powerful exhaust fan.

The volume of dust created will be governed by the character of work cleaned, that is, whether plain surfaces to which little sand adheres, or intricate shaped pieces from which cores must be blasted; also whether sand or metal abrasive is used, and if sand its friability.

Constant change of air should be provided in the [illegible] a minute as the character of the work may demand. The natural tendency of the dust is to rise and this is aided by the intake of the air at the base of the room and its drawing off through the ceiling.

Electric light fixtures are provided, with white enameled reflectors, set into the ceiling of the room and covered with discoloid fronts to protect the lamps from flying abrasive. Ventilation and free observation of the work being so essential to quantity production, these features should not be slighted.

The room can be equipped as the demands of the plant and its output require. Large, heavy castings should be loaded at the molding floor on to grated top cars, the track extending into the sand-blast room and the pieces cleaned on the car without unloading. If the plant is equipped with a monorail this too can be extended into the room and the pieces cleaned while hanging without other handling. For small work a grated top bench can be provided where convenient, and for very small pieces much economy will be found in cleaning on the grates, it having the advantage of saving on tools and giving, without extra time and cost, clean scrap which is particularly advantageous and even necessary in the use of some types of electric furnace.

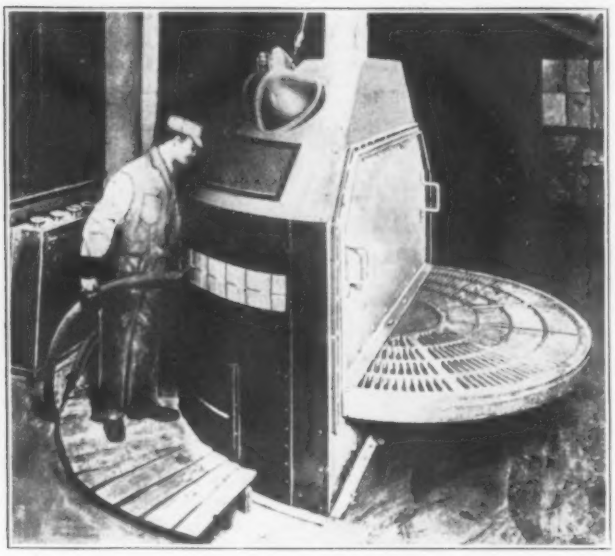
One of the more modern adjuncts to rooms of this nature is the rotative table which is built into, but entirely independent of the room structure. One-half of the table forms a grated bench on the inside of the room, while the other half is exposed outside the room for the removal of the cleaned work and loading of new work to be cleaned. A partition through the center of the table entirely closes the aperture in the wall structure when the table is in position for sand-blasting. As a load is cleaned the operator turns the table, which travels on dust-proof ball bearings.

As mechanical means to all operations other than the actual blasting are increased, output rises without added labor cost, and in plants with large tonnage this becomes absolutely necessary to best economy.

To this end some rooms having a solid floor are provided with a chute in one wall leading to an elevator boot, into which the spent abrasive is swept or shoveled, being raised by a mechanical elevator to a combined mechanical and exhaust screen separator that delivers

*From an address before the Newark Foundrymen's Association, Newark, April 2.

†Pangborn Corporation, Hagerstown, Md.



Hygienic Rooms of This Type, Equipped with Sight Screen, Electric Lighting Above, Rotating Grate Table, and Flexible Curtains for Inserting the Hose, Have Taken Sand-Blasting Out of the Class of "Man-Killing" Jobs

the clean, sharp abrasive for reuse to a sand storage bin connected to the sand-blast machine. The fine dust and refuse is deposited in a refuse bin.

A step further in this direction of mechanical handling is a grated floor for the room through which the spent abrasive falls to a hopper from where a conveyor delivers it to the elevator. Rooms of this type are usually made complete with a hopper of concrete and provision made for an auxiliary sand storage bin, loaded from the outside with several days' supply of abrasive, which is fed to the system through a sand gate as required by disintegration.

Sand-Blasting Performances

These rooms are provided complete by the manufacturer and are designed and laid out in size and arrangement, often in batteries, to meet the individual needs of each plant. The large gray-iron gas engine cylinder shown weighs upward of 5 tons, and required the labor of two men each 15 hr., or a total of 30 hr., for cleaning by hand. It was cleaned with a high-pressure sand-blast by one man in 1 hr., including cores.

Of the steel car couplers shown, by using sand 164 were cleaned in 3 hr. 59 min., including handling, an average of 1 min. 27 sec. for each bar, the average actual blasting time being 52½ sec. By the use of steel shot 182 were cleaned in 4 hr. 8 min. of elapsed time, or an average of 1 min. 22 sec., including handling, or an average actual time of cleaning 41 1/3 sec.

The trend toward hygienic rooms that entirely remove the operator from the sand-blast inclosure has developed devices of different types that meet every demand. The hygienic room is provided with a sight screen on four sides through which the operator may see his work, while below this is a nozzle slot or opening, closed by sectional flexible curtains, through which the operator directs the nozzle on the work to be cleaned. While this permits the operator to work in the open and without other protection than afforded by the room, ventilation is necessary that the created dust may be rapidly removed so as not to obstruct illumination and free observation of the work.

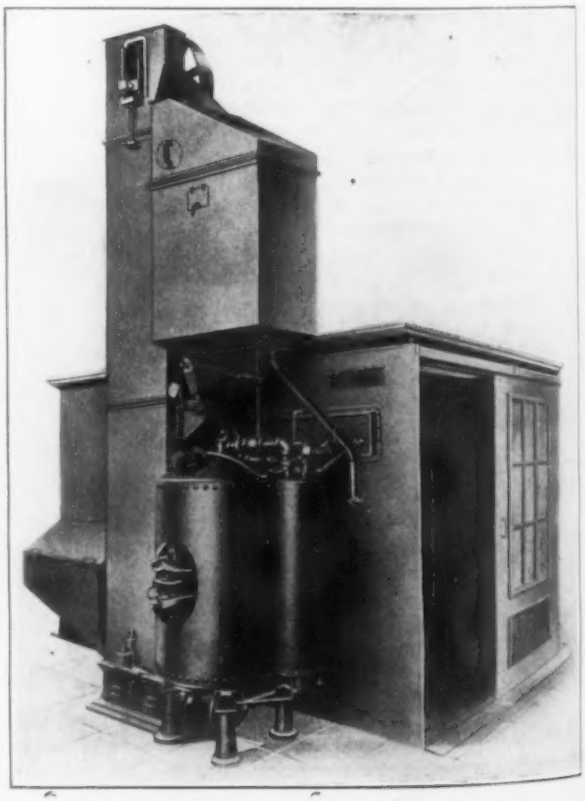
Rooms of this nature are more adaptable to work of rather uniform size, as the width and length of the room should be such as to bring the work reasonably close to the nozzle slot on all sides and keep ventilation requirements at the minimum. These rooms are particularly adaptable to large and heavily cored work, and for cleaning long lathe beds and other work of this nature, and are usually constructed of a length to receive a little more than half the longest piece, with the other half extending through the curtains closing one end of the room, the pieces being reversed for cleaning the other half. In this way pieces 20 to 30 ft. long are readily cleaned in a room of size but little more than half their length.

Where the output of the foundry does not include work larger than may be loaded on to one-half of a table 90 in. in diameter, the hygienic table-cabinet offers the ideal equipment. This cabinet is semicircular, having an opening at the rear to permit of revolving the table, while the upright partition of the table closes the aperture entirely when in blasting position the same as in the room type. By means of the semicircular shape of the cabinet all portions of the table are accessible to the operator, who observes the work through the sight screen and directs the nozzle through the nozzle slot. The work, as in the case of the table with the room, is loaded from the outside by other labor, and in this manner permitting continuous sand-blast operation.

Where limited area makes floor space at a premium the sand-blast machine can be located in a concrete hopper below the floor and the abrasive for reuse passed to the separator by gravity. This type of installation eliminates the use of elevator and conveyor. General utility and ease of access has recommended the floor-level type where floor space will permit.

For the plant that has a tonnage of small work sufficient to warrant special equipment, the barrel sand-blast or the rotary table sand-blast, or both in combination, will be found time and money savers. These units are self-contained, the spent abrasive falling through perforations in the drum and delivered to a hopper, from where it is raised by an elevator, cleaned and screened, and delivered by gravity to the nozzles for reuse automatically. In this type of barrel the interior of the drum is entirely unobstructed, and it will receive pieces up to the limit of the door opening size. Plow points are typical work for a barrel of this type. Other barrels of the suction type have a manifold running through the center with a series of nozzles and as the abrasive falls through the drum perforations it is passed through a series of screens to feed boxes from where it is raised by suction to the nozzle, and in combination with the air projected onto the work. Barrels of this type are more efficient for smaller pieces, such as valve bodies and the like, and from which they will remove the cores.

For work of a fragile nature, such as stove plate, precision work or pieces of shape and size that will not permit rolling within the barrel drum, the automatic revolving table sand-blast is of greatest utility.



Mechanical and Exhaust Screen Separator for Removing All Vestige of Dust, Permitting Reuse of Warmed Air

A Sand-Blast Cabinet Unit for the Small Jobbing Brass Foundry Requires But Little Floor Space, Is Self-Contained and Continuous Feeding

In this device a grated top table is half exposed and half contained within a steel case wherein the blasting operation takes place. The opening at the front of the case to permit free passage of the castings is closed by multiple, flexible, sectional curtains that retain the flying abrasive and created dust during the passage of the work. The pieces are loaded onto the exposed half of the table by the operator and as they emerge from the blasting chamber are turned as may be necessary to bring all parts under the blasting action.

Multiple nozzles oscillate so that the pieces are blasted from all angles, the sides as well as the tops coming under the blasting action. These tables will handle material as fast as a man can load and unload it. The blast action is of the direct pressure type, the nozzles being fed from a direct pressure hose machine beside the table. Operation is continuous, the spent abrasive falling through the grated table top, being carried by an elevator to the abrasive separator that cleans the abrasive and delivers it to the sand-blast machine for reloading.

Either or both of these devices can be installed in combination with the sand-blast room and ventilation provided for all in a single system.

All of these devices, while equally adaptable for the cleaning of brass and aluminum, as well as iron and steel, are of a size and capacity that is hardly warranted by the average brass foundry.

There is, however, as much advantage in the cleaning of brass or aluminum castings with the sand-blast as in the ferrous metals and cleaned on the gates means economy of time and labor with thoroughly cleaned scrap. For the small jobbing brass foundry a self-contained unit in the shape of a sand-blast cabinet meets the requirements from every point of view. The initial cost is not large, floor space required is small and being of the suction type, is self-contained and continuous feeding as well as hygienic, the operator not being exposed to the dust-laden air.

Being simple of manipulation, they can be operated by unskilled or boy labor. These machines are made in various types and sizes, the one illustrated here being 2 ft. wide by 2 ft. deep, with a door opening 10 in. high. Pieces to be cleaned are laid on the grated floor of the cabinet and the operator handles the pieces through arm holes equipped with rubber gloves and canvas gauntlets, seeing the work through a wire and glass-covered opening provided for the purpose.

Dust Arresters

For suppression of the dust created, the simplest arrangement is a settling chamber with baffles that retain the heavier particles, and even this device is found satisfactory only in widely separated plants and where the operations of the foundry do not include machine work.

Where absolute suppression of the dust is not demanded, the centrifugal dry process arrester has been found highly efficient. From 90 to 95 per cent of the created dust is retained in the arrester and discharged through the bottom to a receptacle from which arrangement for removal can be made as desired.

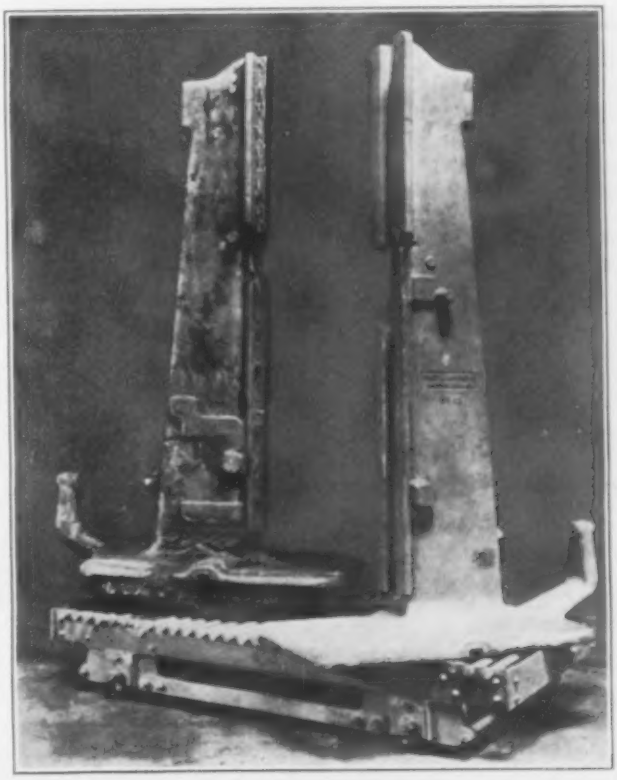
Where, however, entire suppression of all dust is required the cloth screen type of arrester is necessary. This is a steel case in which are located a series of specially woven cloth screens, the dust-laden air entering on one side, the screens retaining all dust and permitting passage only of the cleaned air which is drawn out the opposite side through the exhauster. A decided saving has been made in a great many plants through the use of this cleaned air which, being warm, can be returned into the plant ventilating system or directly to the sand-blast room, as conditions may warrant.

So effective are these arresters that by their use sand-blasting has been possible in large city office buildings and the diverting of the clean, warm air to plant ventilating systems has saved much in fuel where this has been done.

Abrasives

With the progress in sand-blast equipment and methods has come also progress in the matter of abrasives. Various classes of sand are now mined and graded for sand-blast use, and with the abrasive, as with the equipment, the better the quality the greater economy and efficiency. The sand which is hard, sharp, clean, with the least disintegration, not only shows longest life and highest abrasive quality, but creates less dust. River or bank sands are rarely economical, even at lowest first cost. Ocean sands are quite satisfactory, but undoubtedly the white silica sands where available are most desirable. In fact, by their hardness and uniformity they would undoubtedly prove most economical at a considerably higher first cost.

Metal abrasives in the form of chilled shot, crushed steel, etc., are produced by different manufacturers, each making claims for their superiority. Of the life of the metal abrasives over sand there can be no question and this will range from 20 to 60 times. Dis-



Machine-Tool Castings, Showing the Clean Condition from Sand-Blasting with Use of Improved Equipment

integration is at the minimum and almost no dust is created from the metal abrasive itself.

In this connection, however, the much higher first cost demands an absolutely tight enclosure throughout, as any daily loss, even though small, will soon wipe out the saving in efficiency.

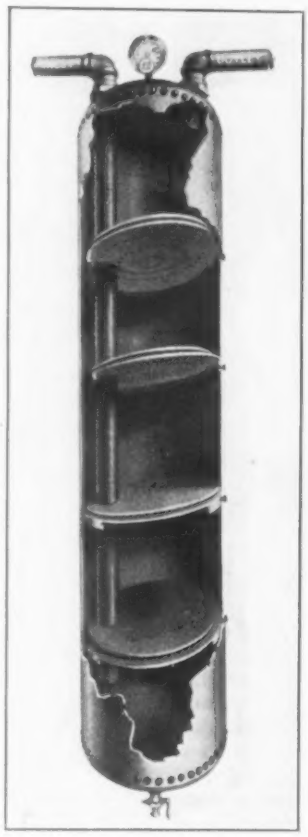
The selection of sand or metal abrasive will present several features for consideration. If the work to be cleaned is reasonably free from sand, considerable advantage in operating conditions will be found by use of the metal abrasives owing to their creating practically no dust by their own disintegration, but if the work is cored or carries a large volume of sand the advantage from the metal abrasives in this connection will, obviously, be greatly decreased, and the dust created by the disintegration of the blasting sand itself will not materially increase the dust volume arising from the castings.

Where pieces are to be galvanized or plated some complaint has been registered against the metal abrasives in that the fine metallic dust adhering to the pieces prevented satisfactory results in plating, but for general foundry output the character of the work itself with the delivered cost of the various abrasives will readily determine the economy of one over the other.

All of the modern sand-blast devices operate with equal facility with either sand or the various metal abrasives.

Air Dehydration

One of the most frequent causes of unsatisfactory operation of the sand-blast is the presence of moisture in the air line which, if in sufficient volume to make the sand at all plastic will naturally prevent even, steady flow and in the use of the metal abrasives the mixture of moisture with the fine metallic dust frequently tends to rust the abrasive into a solid mass. Any device that will eliminate the moisture will be found of decided advantage not only in connection with the sand-blast but with all pneumatic tools. The Emergency Fleet Corporation, in a recently issued standard practice bulletin, describes a satisfactory device for this purpose, and from which we quote:



Sand-Blast Air Dryer Adopted by Emergency Fleet Corporation

"It is the object of this communication to call attention to the importance of a second step which should include provision for effectually separating and draining the water of condensation from the piping system.

"The water cannot be properly taken care of merely by placing drain cocks on low points in the ordinary piping system, but should be removed by special separating tanks or chambers located at these points and near the distributing manifolds.

"The separating chambers should be large enough to lower the velocity of the air to a point where entrained water or dirt will not be carried through with the air current, and should be fitted with bafflers or connections which will change the direction of flow, so as to precipitate the entrained matter."

An illustration of this device is shown and its installation on the air line near the various tools will assure freedom from moisture troubles and will save in lost time their first cost in a comparatively short period.

The live foundryman who investigates the installation of a suitable sand-blast installation will realize results that are not commonly included in an inventory of sand-blast advantages. To the jobbing foundry producing castings that are to be machined, sand-blasting means the entire removal of the scale which on the contrary is intensified by rumbling. This means a big saving in tool expense to the purchaser, an added demand results, if indeed a better price cannot be obtained. The appearance of the castings is very much improved and where castings are to be galvanized, painted or plated, if thoroughly sand-blasted, they are given a surface that assures perfect results with best finish, with a consequent saving to the plating operation.

The foundry that sand-blasts its castings and fails to feature it in its literature and advertising is not taking advantage of one of its greatest assets.

It should be realized, however, that like any other machinery, operating economy comes only through the selection, arrangement and layout of the right devices for the conditions to be met and the work to be handled. Thorough discussion of your needs and conditions with a responsible sand-blast manufacturer and taking advantage of his experience will get best results.

The initial price of sand-blast equipment can hardly be considered an indication of its cost. Any installation so complete as to get the greatest output at lowest cost per ton means a constant and accumulated daily saving, even though small, that in time not only returns the greater price but wipes out the entire cost of the installation, and becomes a moneymaker that will also insure most attractive castings and quick deliveries.

COAL STOCKS DECREASE

Industrial Plants Show Loss—Production of By-Product Coke Increases

WASHINGTON, April 29.—The Fuel Administration has made public a series of statistics showing an alarming decrease in the stocks of bituminous coal held by industrial concerns. These reveal a decrease of 8,000,000 tons or 25 per cent in the three months from Jan. 1 to April 1. Stocks of bituminous coal held by plants engaged in the manufacture of iron and steel decreased 24 per cent from Jan. 1 to April 1.

The decrease in stocks of bituminous coal in the hands of consumers, including the railroads, in the United States the last three months, probably did not exceed 16,000,000 tons. The drop in production of bituminous coal in the same period was 31,000,000 tons, compared with January, February and March of 1918.

The production of coke, both by-product and beehive, in January, February and March, 1919, is estimated at 12,738,700 net tons, an increase of 307,000 tons, or 2.5 per cent compared with the first quarter of 1918. By-product coke increased from 5,321,600 tons in the first quarter of 1918 to 6,779,500 tons in the first quarter of 1919, a gain of 27 per cent. Beehive coke recorded a decrease from 7,110,500 tons the last quarter, a drop of 16 per cent. The transition from beehive to by-product is indicated by the increase in the capacity of by-product ovens completed from 6,793,251 tons on April 1, 1918, to 8,576,489 tons on April 1, 1919, an increase of 26 per cent. Since April, 1919, production of by-product coke has been begun in Colorado and in Rhode Island, and considerable increases in capacity have been made in Maryland, New York, Ohio, Pennsylvania, Tennesssee, West Virginia, Wisconsin, Alabama, Illinois, Indiana and Kentucky.

The decrease in the production of beehive coke in the first quarter of 1919 compared with 1918 in Pennsylvania was 5 per cent, as against a decrease of 40 per cent in all other states.

The Celite Products Co., New York, announces the appointment of Frank Bethune, 808 Perdido Street, New Orleans, as its representative for the Louisiana and Mississippi district. A warehouse stock of brick, powder and cement for insulation, also Filter-Cel for filtration, will be carried.

Effect of Mass on Heat Treatment

Pyrometers Used to Detect Changes in the Interior of 18-In. Steel Cubes While Heating and Cooling—Effect on Properties

IN order to obtain some information concerning the changes taking place in the interior of a mass of steel during treatment, a series of experiments were undertaken, the results of which were presented before the meeting of the Iron and Steel Institute last fall in London by E. F. Law in a paper, "Effect of Mass on Heat Treatment." An abstract follows:

He remarked that with the information now available it is possible to determine the theoretically correct heat treatment for any steel. The practical treatment of large masses of steel, however, presents many difficulties that do not exist in the case of small masses and various questions at once arise, such as how long does it take for the mass to become uniformly heated in the furnace, to what depth does the effect of oil tempering extend, and to what depth is it possible effectively to harden steel by quenching in water?

In the experiments an ingot 25 in. sq. and ten ft. long, weighing nearly 10 tons was cogged down to 18 in. square and cut into 18-in. lengths, thus giving a number of 18-in. cubes, each weighing about 14½ cwt. Only those cubes representing the soundest part of the ingot were employed. Then thermocouples were inserted in each cube, in holes ⅛ in. in diameter, and carefully plugged in position with asbestos. One thermocouple was placed in the center, one halfway between the center of the cube and the center of one side, and ¼ in. deep in the center of one surface. These couples were inserted before the cube was placed in the furnace and remained in position throughout the treatment, continuous records being taken. The cubes were placed in a gas-fired furnace at a temperature of 1650 deg. Fahr., and that temperature was maintained. The heat penetrated to their centers with remarkable rapidity. After 130 min. the temperature at the center and halfway was almost the same, though at this point the absorption of heat due to the Ac change caused a greater lag at the center than elsewhere and the two temperatures did not approach one another again until after another 70 min.

Phenomena of Cooling

After about 4½ hr. the cubes attained a uniform temperature throughout—practically that of the furnace. When this stage was reached one of the cubes was withdrawn and placed on knife edges to cool in the air. Cooling took place very slowly and the evolution of heat was most marked in the center of the mass. A second cube was plunged in oil and, since a large volume of oil was used, the cooling was rapid. In the center the evolution of heat at the Ar point was very noticeable, but in the halfway curve there was no indication of recalescence.

A third cube was cooled by spraying water at a pressure of 10 lb. per sq. in. on the upper and lower faces. The cooling was more rapid than in oil. The curve of the center again showed an evolution of heat and was not unlike the oil-hardening curve, though the rate of cooling through the lower ranges of temperature was more rapid. The halfway curve, however, was totally different. There was no sign of recalescence in the upper range and the temperature fell evenly to about 450 deg. Fahr., when there was a sudden acceleration in the rate of cooling, followed by an equally abrupt halt at about 250 deg. The curve for the cooling of the outside of the cube showed somewhat similar features. In an experiment in which the cube was plunged into water at 55 deg. the cooling was somewhat more rapid, but the curves showed exactly the same characteristics.

The important difference between cooling in oil and in water was the almost sudden slowing up of the cooling with the former in the lower ranges of temperature, as compared with the cooling in water. The time required for the center to cool from 1650 deg. to 1000 deg. was almost the same whether oil or water was used, but in cooling from 1000 deg. to 600 deg. the cube in oil required twice the time and from 600 deg. to 300 deg., nearly four times as long. The differences were even greater for the outside of the cube. Both in oil and water there was a period during which the metal in the center was cooling more rapidly than that midway between center and surface.

Mechanical Tests

From each of the experimental cubes, after cooling, a section 1 in. thick was cut through the center and from this section 13 test pieces were machined, so that mechanical tests could be made on metal representing the steel from the outside to the center of the cube. The 13 results from the air-cooled cube gave practically identical results. In the oil-quenched cube the breaking stress and yield were both raised, while the elongation was lowered, to almost the same extent in every test. In other words, the effect of the oil quenching was as apparent in the center as at the outside. The results obtained by water-quenching, however, showed very decided variation from surface to center, most marked in the case of the cube plunged in cold water.

The abrupt halt in the neighborhood of 250 deg., shown in the curves for the water-cooled samples, was totally unexpected. The author gave reasons for supposing that it was not connected in any way with the water but was due to some change in the steel itself, and he recalled some results obtained by previous investigators of the properties of iron and steel at low temperatures, which suggested the possibility of a transformation not hitherto recognized. On carrying out some experiments with 2-in. cubes, the break in the curve at 250 deg. was very noticeable with oil-hardening, whereas in the water-quenched cube no break in the curve was observed. Further, the latter cube was too hard to machine and, after grinding and polishing, was found to possess a martensitic structure, while the oil-quenched cube was readily machined and possessed a pearlitic structure. Repeated experiments on quenching at different rates showed that whatever the rate of cooling through the higher ranges of temperature down to 572 deg. no appreciable hardening effect was obtained, and the hardening was effective only when the rapid cooling was continued through the lower ranges of temperature.

Discussion

Cosmo Johns, in discussing the paper, said that the quenching of steel from a high temperature, owing to the volume changes involved, caused the interior to be severely compressed. From known principles it followed that the position of any transformation was altered by pressure, and if the nature of the volume change was known it could be predicted whether the transformation was raised or lowered. In the case of steel, the effect of pressure would be to lower the temperature at which recalescence took place, and this was clearly shown on the author's cooling curves taken from near the surface and halfway towards the center.

Sir Robert Hadfield said the author referred to some experiments of his own in connection with the spontaneous generation of heat. He was glad to say that those investigations were being pursued, and he believed some very interesting results would be obtained.

Without a doube there was a spontaneous generation of heat at the critical temperature; in fact, at a slightly lower temperature than that to which the auhor referred. Before long, if it was of any interest, he hoped it might be possible to read a paper to the Institute on the subject, as it was very important, especially to those who were dealing with material in connection with armor plates, projectiles, or other special lines of work of that kind.

Cracking of Hardened Steel

G. S. Heaven raised the question whether Mr. Law had any experience on the bearing of the phenomena which he had discussed on the question of the cracking of hardened steel? In 1914 his company had considerable trouble in hardening form cutters of rather intricate design; they either cracked during the hardening operation or immediately afterwards, or failed very quickly in work in the shops. They tried all kinds of treatments to get over the trouble, and complained very seriously to the steel manufacturer, but that did not do any good. Finally a colleague of his, J. A. Thompson, was convinced that, whatever the cause of the trouble was, it lay somewhere in the low-temperature regions, and they developed the following practice: The tool, previously normalized, was hardened by immersion in water for a number of seconds, depending on the size and shape of the particular tool in question; it was then immediately plunged into oil and cooled off. He would like to ask the author whether in his opinion the lag induced by that later cooling in oil allowed the thermal change to proceed, and whether it was that fact that had cured the particular troubles mentioned.

Quenching Gun Forgings

H. H. Ashdown said that about 10 years ago, during the quenching of heavy gun forgings, efforts were made at Woolwich to record the fall in temperature through the critical ranges, but he did not think that any data had been published. In quenching out large masses of varying section, such as heavy gun forgings, he had often noticed at least three distinct vigorous disturbances of the oil at marked intervals, corresponding with periods of evolution of heat, and it would be very interesting to learn what took place there. Possibly the author would be good enough to follow the matter up and contribute a later paper. Another point which appealed to him was the value which might be obtained from forgings quenched in oil down to approximately the low critical point and then withdrawn quickly and quenched in water.

E. H. Saniter said that a great many years ago he had discovered that if a small piece of steel was taken and reheated for a certain length of time to 250 deg. some remarkable results were obtained, which he attributed to the state of strain, and he found in later years that the fact which he discovered about 10 years ago had been of the greatest practical value. In many steels in the ordinary heat-treated condition, or even in the raw condition, the steel was in a state of stress, and by reheating to a comparatively low temperature that stress could be got rid of, and the steel remarkably improved. He was speaking of small pieces, because the same thing did not apply to masses. It appeared to him possible that the evolution of heat was due to the creation of a state of stress in the steel, and if that evolution could be suppressed the steel might be obtained without stress.

The Author's Reply

E. F. Law, replying to the discussion, wished in the first place, as a practical man, to take Cosmo Johns to task for suggesting theoretical explanations which did not fit in with practice. Of course, the obvious explanation of the low point was a depression of the critical point, as would occur to anybody at first sight, but when he came to look into it he found that that explanation would not fit in with the facts, and Mr. Johns would have to find another explanation. Mr. Heaven spoke of the cracking of hardened steels. Cracking occurred frequently, and he believed it had not been unknown in shells. It occasionally happened that hardened articles broke down for no apparent reason some considerable time after they were hardened, and it was just possible that the low point, or points, had some bearing on the question. With regard to Mr. Ashdown's remark that the small cubes were not comparable with heavy forgings, he really believed they were. Eighteen inches was a very remarkable thickness for any forging. He purposely did not deal with gun forgings, armor plates, or any of those things, in the paper; partly because he doubted whether the paper would have been allowed to be published, but mainly because he wanted to get elementary data on fixed and uniform sizes.

One of the Charcoal Furnaces Once Active in South Jersey

EARLY in the spring of 1816 a man interested in the iron industry built a furnace at the head of the Tuckahoe River at Tuckahoe, N. J., for the manufacture of saddle bag stoves in use then for many years. This iron manufacturer, Howell by name, put his furnace, which he called the Aetna furnace, in operation on July 4, 1816, and built 40 houses near the furnace for his workmen. Ore was brought to the furnace in small barges up the Tuckahoe River, but in 1837 after 21 years of operation the furnace became unprofitable and closed down.

In the years that followed, all evidence of the former industry went to decay except the stone furnace, and occasionally some hunter or woodsman would come across it in the woods above Tuckahoe. The winter weather opened up great cracks in the stone work, sand carried on the wind settled there and no doubt through the visit of birds the seed of a wild cherry was carried there and it took root. For years there grew from the very roof of this stone furnace, a wild cherry tree, also a cedar tree, both stunted in growth and of apparently considerable age.

Aetna Furnace Near Head of Tuckahoe River

A few years ago Aetna furnace was torn down and the stones of which it was built are now resting in the foundation of the Aetna Hotel at Ocean City, N. J. (since renamed the Cumberland and now the Normandie), which is about 20 miles from the site of the Aetna furnace.

Another early New Jersey enterprise in charcoal blast furnaces was that at Allaire, N. J., illustrated in these pages in the issue of April 4, 1907, in an article by Richard Peters.

Operation of Gas Producers

Rule-of-Thumb Method Suitable for Everyday Plant Conditions—The Three Zones—Hot Gas vs. Cold Gas

BY J. S. M'CLIMON*

A NEW gas producer, before being started, should be dried out several days with small fires. This is a precaution which, if properly carried out, will add considerably to the life of the lining. After the producer has been thoroughly dried, all large pieces of wood likely to cause trouble should be removed and the producer filled with ashes to a depth of at least twelve inches over the top of the blower. It is best that a few large clinkers be placed around the openings of the blower to keep them from becoming clogged with fine ashes. These ashes are necessary to protect the metal parts of the producer. They also act as a diffusing medium to distribute the blast over the entire fuel bed thus insuring even combustion.

Starting the Producer

To start the producer, it is necessary only to level off the ashes, throw in several armfuls of small dry wood, saturate with kerosene, and light with a piece of waste. After the wood has burned for a few moments, turn on about 10 lb. of blast and blow until the wood is well ignited. A small amount of coal can then be dumped and the fires be built up gradually. Care should be taken that the coal is not fed too fast. Allow a good bed of coke to be formed before any attempt is made toward crowding the operation of the producer. One should remember that it takes several hours to get a producer fire built up properly to the point where it is making good gas.

No special attempt need be made at this point to get the fire distributed over the entire fuel bed. It will spread of itself later, and it is usually better to have a good fire at one point than several small ones scattered over a larger area.

In case it is necessary to stop the producer at any time, the blast should be immediately turned off and never exceed 10 lb. during this idle period.

The various zones of the producer are shown in the drawing on the opposite page. It can be seen that there are three, the ash, the incandescent or the fire zone, and the green coal zone, this last consisting of coal which has not received a sufficient amount of air to become incandescent. This is also termed the distillation zone. The existence of these three zones is a point often overlooked in the operation of the producer.

Measuring Fires

The usual method of measuring the fires is for the foreman to take a rod about 5 ft. long which he inserts in one of the pokeholes in the producer top until he establishes the height of the fuel bed. This method is totally inadequate, because no attention is given to the depth of the fire zone, the most important point of all in the operation of a gas producer. If the ash zone is allowed to exceed a reasonable limit, say 15 in., the fire zone is considerably reduced, and it is impossible to carry the proper depth of fire if the ashes are not kept within a reasonable limit.

This tendency of the ashes to crowd out the fire zone makes it possible for the top of the fuel to be at the proper height and yet the fire may be so thin that the gas will be of exceedingly poor quality.

The only way the fires can be properly measured is to force the rod completely through the fire and allow it to remain long enough to become red hot. After the rod has been withdrawn, it is easy to see the part which has been in contact with the hottest portion of the fire and the part which has been protected by the ashes. Knowing the distance to the blower or the metal parts of the producer, it is a simple matter to tell exactly the depth of the various zones.

A very convenient rod for this work consists of a ¾-in. gas pipe marked into 2-ft. sections by ¼-in. rivets running through the pipe. Any other method of marking may be used which will not be destroyed by the action of the fire or interfere with the passage of the pipe through the fuel bed. A mark is also placed at the height equal to the distance between the blower and the producer top. This indicates the distance the rod should be forced into the producer. Fig. 3 shows such a rod, the method of marking, and its appearance after being withdrawn from the fire. In using the rod, the distance to the top of the fuel bed is first determined. The rod is forced through the fuel bed until the lower end is on a level with the top of the blower and allowed to remain there for two or three minutes. This is usually all the time necessary for the rod to remain in the fire. On being withdrawn, it will be noted that there are two parts which show up distinctly—one a smoky black extending for several feet, and the other a very hot portion usually from 12 to 14 in. in length. This latter indicates the incandescent zone. Below the lower point of this zone and the end of the rod there is a portion not affected by the heat, and it should not be very hot. This is the ash zone and should never be less than 6 in. and seldom, if ever, exceed 15 in.

Between the highest point of the hot portion of this rod and the distance determined to the top of the fuel there will be a space of from 6 to 12 in. This is the green coal zone. If the coal is of a tarry nature it is possible that this zone will stand out distinctly by a tarry deposit upon the rod, which can be readily distinguished from the sooty deposit above this section. The sooty portion of the rod represents the part in contact with the gas.

It is not intended that this method of measuring the fires should be employed more than two or three times per day, depending upon the number of times the fires are cleaned, but this is the only way the ash zone and the fire zone can be measured and the amount of ashes that it will be necessary to remove be determined.

If the fires are measured just before the change of turns twice a day it eliminates all chance for the men to excuse their own indifference by blaming the other shift for trouble which might be of their own making.

Hot or Cold Gas

The green coal zone mentioned in previous paragraphs may vary with requirements. If it is intended to generate a hot gas, that is, gas leaving the

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producer at a temperature of about 1200 deg. Fahr., the coal zone should not be allowed to exceed 6 to 8 in. The gas showing when the pokehole cover is removed will be a brownish black and a small pilot flame or color cone of about 3 in. in length will appear in the center of the escaping gas. If, however, it is desired to generate what is termed a cold gas, a deeper layer of coal must be carried over the incandescent fuel. This may be anywhere from 8 to 15 in., depending more especially upon the nature of the fuel. Under these conditions, the gas appearing when the pokehole cover is removed will be a bluish white and the temperature when leaving the producer may be as low as 700 deg. Fahr. This is by far the richest and best gas for most purposes. The hot gas usually carries a B.t.u. value per cu. ft. of about 150, while the cold gas may have a value of 170 to 180 B.t.u. per cu. ft.

Some operators insist that cold gas will not operate efficiently in open-hearth furnaces or other places where it is desired to carry a melting temperature. This is a matter open to some discussion. We know of several open-hearth plants in very successful operation using cold gas by preference.

Points of Attention

Some coals have a tendency to become soft and pasty under the action of the heat in the producer. This restricts the passage of the gas, and owing to the fact that the pressure accumulates under the steady blast, the gases will seek channels to break through the resistance of the fuel bed. These points then become excessively hot, melting the ashes and other foreign particles in the coal which form the basis of clinkers.

If the coal in use is of this nature, care should be taken to see that these channels do not form. This can be done by close attention to the stirring and the regulation of the blast, or it may be necessary to change the mixture of the blast, increasing the proportion of steam to the amount of air blown.

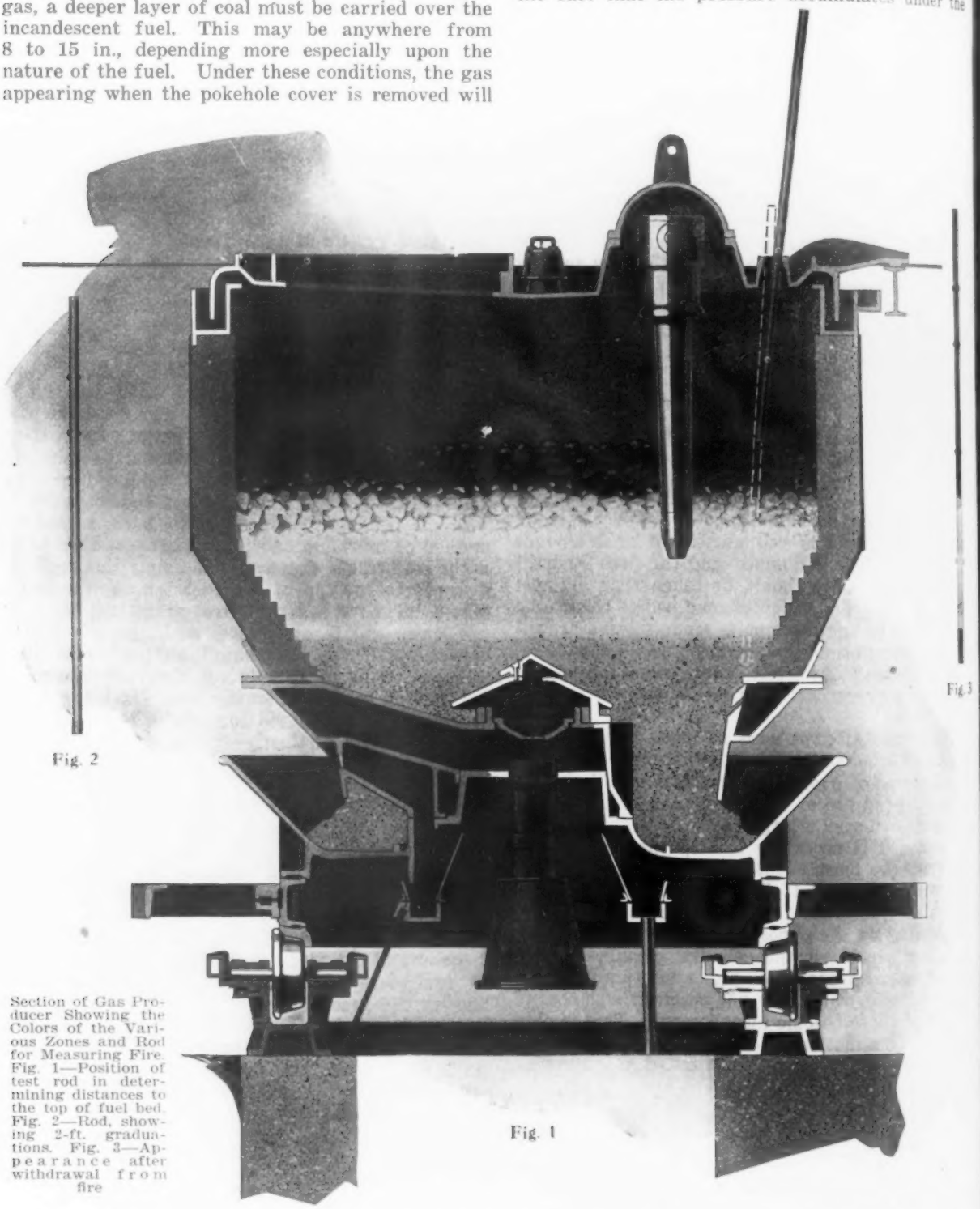


Fig. 2

Fig. 3

Fig. 1

Section of Gas Producer Showing the Colors of the Various Zones and Rod for Measuring Fire. Fig. 1—Position of test rod in determining distances to the top of fuel bed. Fig. 2—Rod, showing 2-ft. graduations. Fig. 3—Appearance after withdrawal from fire

This will lower the temperature of the fire and thus considerably decrease the tendency for the fires to clinker. It should be remembered that the change should not be carried to the point where the CO_2 content in the gas becomes excessive or the fires are so cooled that the carbon in the coal is not properly gasified. Either of these items determine a certain amount of loss, but the situation should be considered as a whole and decision made as to whether the stoppage due to clinkering and the extra labor attendant to the same are not more than an offset for the few percentages of the CO_2 or a slightly increased amount of carbon in the ashes.

Cleaning the Fires

It is the usual custom to clean the fires about two or three times a day, depending upon the amount of coal burned and the percentage of the ash in the coal.

It is not necessary that the operation of the producer be discontinued during the cleaning period. The fire should never be lowered more than 8 or 10 in. during one cleaning period, and coal should be dumped as during the regular period, although usually in smaller amounts. It is better to lower the pressure on the blowers 10 or 15 lb. during this period. If two or more producers are arranged to operate on the same line the other products should be blown slightly harder during this interval, and if this operation is properly carried out, the entire battery of producers may be cleaned without the slightest noticeable effect in the operation of the furnaces. During the cleaning period careful attention should be given to any clinker formations that are likely to appear on the side wall. These should be broken loose and the side walls kept clean.

Feeding Coal

The proper dumping and distribution of the coal charges have a decided bearing upon the conditions obtained in producer operation. The coal should be dumped in as small quantities as can be conveniently arranged, and strict attention should be paid to the color and appearance of the gas which shows, whether or not the fuel bed is of the proper thickness.

Steam Requirements

The amount of steam required to blow the producer varies with requirements. If it is necessary to crowd the machine, more air is needed to burn the increased amount of coal, and as the proportion of steam and air must be maintained, it is only necessary to increase the steam pressure until the proper amount of air is delivered. This in no way affects the quality of the gas if the fires are kept in the proper condition. Gas of just as good quality can be made at 100 lb. pressure as at 15 lb.—only the volume will be greatly increased and it is possible for the fires to get out of order much more quickly. It is hard to set a definite limit upon the amount of steam required, but as a general thing it is seldom necessary to use more than 40 lb. of steam to get the desired results.

Cooling Water

In starting a new producer the top plate has a tendency to run hot and will usually require about all the water that can be applied through the three connections furnished. After a few days the top plate becomes coated with carbon and the quantity of the water can be considerably reduced. The overflow from the poker is usually sufficient for all purposes, and this amounts to approximately 15 to 20 gal. per min.

If for any cause the water pressure should be lost so that no water will flow through the poker the producer should be immediately shut down and every effort made to keep the poker cool by means of an emergency line of steam or air. Caution should be exercised in starting the water to flowing through the system because if a large amount of cold water is allowed to strike the poker there is danger of the point breaking, making its replacement necessary.

The life of a poker tip is from six months to a year, depending considerably upon the condition in which the operator has kept his fires. This tip is a separate point screwed into the main barrel of the poker while the latter is heated to a cherry-red color. This method of applying new tips should be used to prevent their working loose under the action of the fire. It is good policy to have a spare poker and trunnion ready for immediate use and the entire poker and trunnion changed, if it is necessary to make a replacement during the operating period. This operation should not require more than 20 min.

Shutting Down

In most installations there are periods when the furnace is down for repairs. This time should be taken to clean out the producer completely. The side walls should be cleaned, the blower and blast boxes cleaned out and any mechanical part needing attention should be repaired. This procedure, if carried out, will never amount to a great deal of labor and it will be more than repaid by the increased reliability of the machine and the success attained in its use.

Oxidizing Atmosphere in Electric Steel Furnaces

Discussing "Electric Furnaces in Steel Making" recently before the West of Scotland Iron and Steel Institute at Glasgow, Victor Stobie said that it was thought by some unacquainted with electric furnace practice that there was necessarily found a reducing atmosphere inside all electric furnaces; but this was a mistaken notion, proved by the ease with which the raw materials thrown into some furnaces oxidized even without the help of iron ore or other solid oxidant.

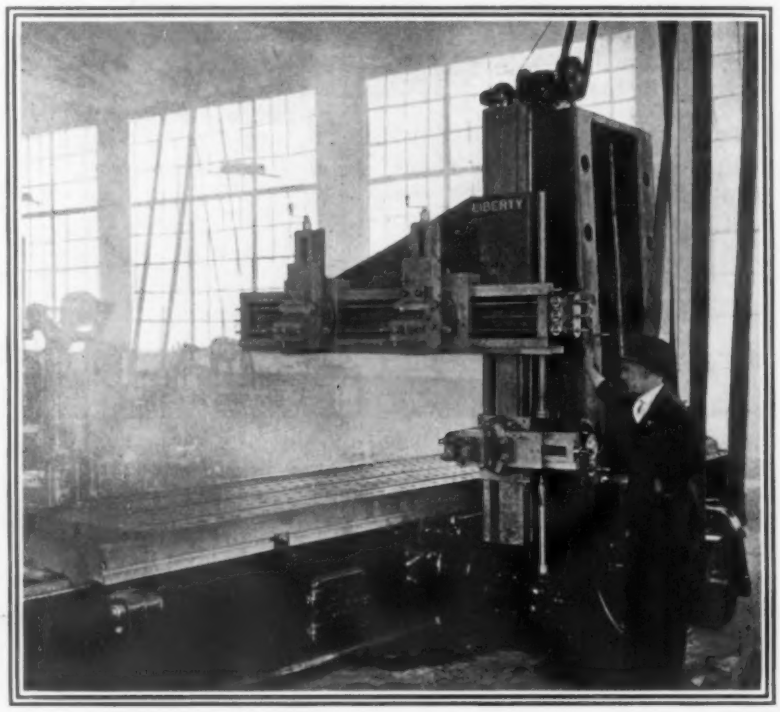
The cause of the oxidizing atmosphere inside the older electric furnaces was the crude method of feeding the electrodes into the melting chamber. Although, at first sight, it might seem quite a simple matter to close up the clearance between the roof of the furnace and the electrodes passing through it, yet there were difficulties. It had often been attempted to make the water-coolers round the holes a sliding fit on the electrodes; but, to enable this to be done, the electrode must be machined to size—a most expensive detail when amorphous electrodes were used. Then every time an electrode was raised—a constant operation in electric steel melting—some white hot or bright red hot part of the electrode would be raised into the air above the furnace roof, and would burn away at the surface to a small or great extent. This difficulty had now been successfully overcome, he claimed, in the Stobie electric furnaces; thus, if an electrode was closed hermetically from the roof up to about 2 ft. above it, the burning away of the electrode and the escaping of the heated gases from the furnace were prevented.

The Craemer Nail & Supply Co., New York, has discontinued acting as sales agent for the American Steel Co., Pittsburgh, whose wire nails it has sold in the New York market for the past six years. Henry Craemer, president of the company, who has been in the nail business in New York for 13 years, will continue in it as an independent merchant, and the Craemer Nail & Supply Co. will buy and sell for its own account, hereafter, instead of selling as agent.

A 48-In. Open-Side Planer

The open-side planer illustrated is manufactured by the Liberty Machine Tool Co., Hamilton, Ohio. The design embodies features of the company's double housing planer and in addition handles work of greater width.

A feature is the rigid construction of the cross rail and column. The cross rail is triangular shaped with a long and narrow guide extending upward on the front of the column and is bolted and doweled to the triangular brace or knee. The knee extends to the rear of the column, with tongue in rear tee slot, supports the cross rail and is rigidly clamped with tee slot bolts in the side of the column, thus to keep the rail square with the table when the bolts are loosened for raising or lowering the cross rail. The column is of two-post box type extending to the floor and is bolted and doweled to the side of the bed, with the base arranged for bolting to the foundation.



This Liberty Open Side Planer Retains the Advantages of the Company's Double Housing Planer and also Handles Work of Greater Width

The top of the bed is closed between the tracks except through the gearing section, which is reinforced by heavy girths. The tracks are wide and V-shaped with an ample spread to eliminate any unnecessary overhang of the table and are fitted with automatic oil rollers. A place is also provided for the operator's tools.

The table is provided with "T" slots and reamed holes throughout its entire length. The running gear is placed inside the bed and is accessible from the top. The gears are pressed onto the hubs of the pinions relieving the shafts of torsional strains. The driving pulleys are of aluminum with cast iron centers. The loose pulleys have wick oiled bronze bushings and solid web instead of arms to insure the safety of the operator.

The entire mechanism is enclosed, avoiding the accumulation of dirt on the cam and other moving parts. By means of shifting levers on both front and rear sides of the machine, the operator can control the motion of the table without walking around the planer. A safety lock secures the shifting mechanism and prevents accidental starting of the planer table.

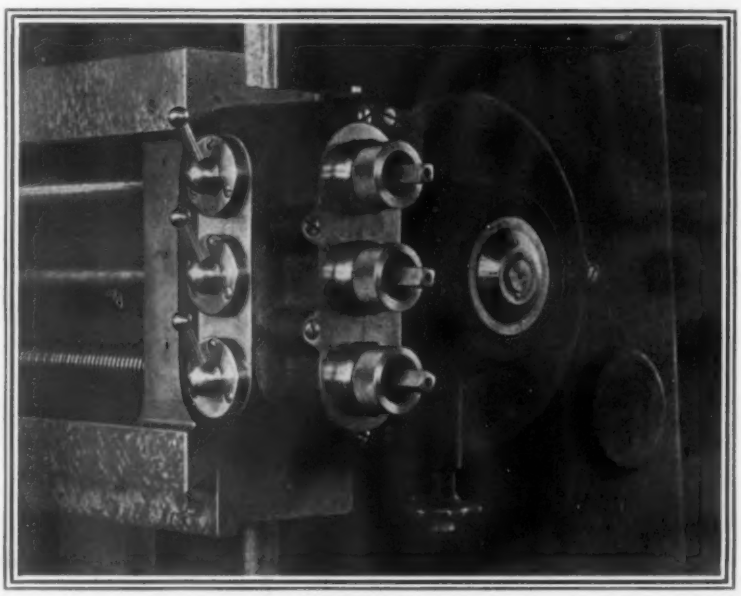
The operator can control or change the feed on the cross heads without stopping the machine or disturbing the feeds on either right or left side heads, the amount of feed being indicated by a dial.

The rail heads have long and wide bearing surfaces on the cross rail and are made right and left for close range. They are graduated for swiveling up to 90 deg. in either direction, and have automatic feeds in all directions operative from either end of the cross rail. The down feed screws under strain are in tension. Micrometer adjustments are provided on all vertical and horizontal feed screws.

The power elevating device is located on the top of the column. A long handle on the rear side of the column operates a saw tooth clutch for raising or lowering the cross rail. The handle must be held in position while operating and any obstruction will disengage the clutch, thus avoiding breakages. All gears are idle when not in use.

The side head is mounted on the front of the column, is counterbalanced and can be moved below the top of the table when not in use. Micrometer collars are provided, graduated for swiveling up to 90 deg. in either direction. The tool block is fitted with a self-releasing spring plunger.

When it is desired to operate as a double housing four-head planer, the machine is arranged so that the left-hand housing and head can be attached at any time. The planer can be arranged for either belt or motor drive. All parts are made to jigs and are interchangeable. The unit system of parts makes it possible to attach any additional unit, such as heads or various motor or belt drives, at any time after the planer is installed.



Automatic Safety Feed

An order has been placed by the State Road Commission of West Virginia with the Board of Public Roads, Washington, for 110 motor trucks to be used in road construction in West Virginia. These trucks are part of the surplus of material of the War Department, which will be turned over to the road commissioners of the various states. The motor trucks will be apportioned according to the area of population and postal mileage of the rural free delivery service in the various states. The commission figures that West Virginia's share of the trucks, when they are finally allotted, will be 200.

Prices Yesterday, Today and Tomorrow*

Causes of the High War Levels Were "Scarcity Demand," Higher Labor Costs and Inflated Currency—Only Slight Reduction Forecast

BY O. P. AUSTIN

THE purpose of this address, as implied by its title, "Prices Yesterday, Today and Tomorrow," is an attempt to look into the future and determine the probability as to the course of prices. That there have been great and continuous advances during the war period we are painfully aware, and in the five months since the cessation of hostilities we have failed to experience the reduction which some had fondly hoped would come with the close of the war. In a few instances there have been slight reductions, but in others there are still advances, and the index figures on foodstuffs in New York to-day are actually higher than those on Nov. 5, when the whole world so joyously welcomed the apparent termination of the great conflict which had raged for 51 months.

To attempt to determine what is likely to happen in the future we must try to find the cause of the things which have happened in the past, and also to see whether this cause is or is not likely to continue in the near future. When prices began to advance in the opening of the war, we could readily see that the upward movement was due to the urgent demand for the food and raw material required by the enormous armies which had been put into the field, and this cause has been designated the "scarcity demand," but when we found the advance extending to many articles in which there was no scarcity and which were not used by the armies or utilized in the manufacture of their requirements, we began to realize that a part of the advance must be due to some cause other than mere war or scarcity demands.

Price Advances Were Worldwide

Raw silk, for example, for which the war made no special demand and which was produced on the side of the globe opposite that in which the hostilities were occurring advanced from $3 per lb. in the country of production in 1913 to $4.50 per lb. in 1917, and over $6 per lb. in the closing months of the war. Manila hemp also produced on the oppostie side of the globe and not a war requirement advanced in the country of production from $180 per ton in 1915 to $437 per ton in 1918. Mechanically ground wood pulp, not a war requirement, advanced as our publishers are aware, from $14 per ton in the opening months of the war to $35 per ton in the opening months of 1916, and the grade known as "chemical bleached" advanced from $30 per ton at the beginning of the war to $160 per ton in January, 1919. Goat skins, from China, India, Mexico and South America advanced from 25 cents per lb. in 1914 to over 50 cents per lb. in 1918, and yet goat skins were in no sense a special requirement of the war. Pig tin, produced by Chinese labor in the Malayan Peninsula and the Dutch East Indies, and not to a very great extent a war requirement [The price of tin was directly affected by the enormous war demand for canned products.—EDITOR] sold in the country of production in 1914 at 30 cents per lb., and in the same markets at 75 cents per lb. in the closing weeks of the war. Sisal grass produced in Yucatan advanced from $100 per ton in 1914 at the place of production to nearly $400 per ton in 1918, and Egyptian cotton, a high-priced product, and thus not used for war purposes, jumped from 14 cents per lb. in Egypt in 1914 to 35 cents per lb. in 1918. Even the product of the diamond mines of South Africa advanced from 60 to 100 per cent in price per karat when compared with prices that were current in the opening months of the war.

The prices which I have quoted to you are in all cases those *in the markets of the country in which the articles were produced* and in most cases at points on the globe far distant from that in which the war was being waged. They are the product of countries having a plentiful supply of cheap labor and upon which there has been no demand for men for service in the war. The advance in the prices quoted is in no sense due to the high cost of ocean transportation since they are those demanded and obtained in the markets of the country of production.

All Classes of Producers Affected

Why is it that the product of the labor of women and children who care for silk worms in China and Japan, of the Filipino laborer who produces the Manila hemp, the Egyptian fellah who grows the high grade cotton, the native workman in the diamond mines of South Africa, the Mexican peon in the sisal field of Yucatan, the Chinese coolie in the tin mines of Malaya, or the goat-herd on the plains of China, India, Mexico or South America has doubled in price during the war period? The articles enumerated were in no case for use in the war and the prices are those in the country of production and thus not due to the increase in ocean freights or dangers of oversea transportation. The advance has been general, world-wide. In a few articles in which an over-production was occurring in which the demand fell below normal the advance was not so strongly marked, but there is scarcely an article in the long list of those entering world markets in which there has not been an advance, no matter how distant its place of production from that in which the war was occurring or how little the war's demands for it or for the labor by which it was produced.

Surely there must have been some general underlying causes for this world advance, this simultaneous demand by people of all classes and in all parts of the globe for higher prices for their products irrespective of their relation to war requirements. While we may be willing to accept the immediate demands of the war as a partial explanation of the advance in the prices of foodstuffs and certain manufacturing material and manufactures we must look farther for the cause of the similar advance in articles upon which the demands of the war could have had no direct bearing. It is true that a marked advance in the price of one important class of products does cause an advance in the prices demanded for other articles which must be exchanged for those in which the advance has already occurred, but it does not seem probable that the advance due to scarcity of a comparatively few of the world products required for war could have been the chief cause of the doubling of prices in practically every article produced in every part of the world, many of which had not the most remote relation to war requirements.

Principal Causes of Advance in Prices

Apparently the principal causes of the advance in prices during the war were, stated in their chronological order: First, "scarcity demand"; second, the advance in wages presumably due to the increased cost of living and demand for labor, and, third, the large increase in world circulating media, or to put it in a single word, "inflation." Prof. A. C. Miller, member of the Federal Reserve Board, an authority whose views are entitled to high consideration, in a recent address before the American Academy of Political

*An address before the Editorial Conference of the New York Business Publishers' Association in New York, April 11. The author is statistician of The National City Bank of New York.

and Social Science named as the two chief causes of the advance in prices, "scarcity demand" and "inflation," adding that "there is so much evidence of an artificial abundance of money in comparison with the things that are purchasable by it that the abundance of money must be credited *with at least* an equal influence in explaining the high prices which have prevailed."

Edgar Crammond, the distinguished British statistician and economist, in an address before the London Institute of Bankers on March 26, 1919, stated that the three facts which would tend to make the fall in prices a very gradual one are: (1) The vast increase in the amount of paper money; (2) the huge increase in the amounts of public debts of the belligerents; (3) the determination of labor to maintain wages and improve the standard of living.

The "Scarcity Demand"

What were the articles for which the war created a scarcity demand? Food, clothing, transportation facilities, and material for the battlefield. How much did it add to the world's demand for these articles? Of course, the percentage of increase in demand for strictly war materials was very large, but was there really as great an increase in demand for other materials, food, clothing and transportation facilities as we are accustomed to imagine? Let us assume that the number of people participating in the war was 40,000,000, which is probably more than those in the field at any one time. Do we realize how small a share those 40,000,000 were of the world's consuming population? Less than two and one-half per cent. We think of 40,000,000 as a large number of people to feed, and so it is, but it must be remembered that the number of people in the world who must be fed and clothed and supplied with transportation facilities every day of the year is 1,800,000,000 or 45 times as many as the highest number in the military service at any time during the war. Of course the soldiers were better fed than are many of the people in certain sections of the world, but even if their per capita consumption was four times as much as the average it would still represent but a small percentage of the world's daily food consumption. And it must be further remembered that all these 40,000,000 people in the armies had been consumers of food before the beginning of the war, not to quite as great an extent perhaps as after entering the activities of the military service, but it cannot be assumed that the war added 40,000,000 to the world's consumers of food and clothing. Nor can it be properly assumed that the withdrawal of these millions from the industries actually reduced to that extent the world's producing power, for 4,000,000 of these were already in the military service and the places of the other 36,000,000 were to a considerable degree filled by others who had not been up to that time actively engaged as producers.

Industry Turned to New Lines

Much of the material used in preparing the supplies for the battlefield was "switched" from the usual lines of industry, for there was an immediate cessation of railroad construction, building operation, and 1000 industries which formerly required manufacturing material and as a result of this cessation of activities the material formerly used by them became available for war purposes.

It thus appears on close analysis that the "scarcity demand" created by the war was not as great in food, clothing, or manufacturing materials as has been pictured, while the fact that 15,000,000 are still under arms minimizes the reduction in military demands which had been expected.

One factor often mentioned in the attempt to determine the causes of high prices is the advance in wages of labor, but the fact that the increase in compensation of labor was in most cases given because of the fact that the cost of living had already advanced at least somewhat minimizes the relative importance of this factor in attempting to discover the real causes of the general world-wide advance in prices. And it must also be remembered that several million persons who had not been engaged in the industrial and business world came to the assistance of those engaged in these duties during the war.

Increase in World Currency—"Inflation"

Where then shall we turn in the search for the principal cause of the general advance in prices of articles produced the world over and their relation to the demands of the war? What other cause can we find after giving due consideration to the scarcity demand, the destruction by war and the increased cost of labor? The most prominent among the possible or probable causes is the theory advanced or accepted by the historians, economists, statisticians and financiers of the world that inflation in currency is usually accompanied or closely followed by an advance in prices; and, as already indicated, so high an authority as a member of the present Federal Reserve Board, Professor Miller, has recently declared that "the abundance of money must be credited with at least an equal influence in explaining the high prices which have prevailed."

I wonder if we do fully realize the quantity of paper money which the responsible governments of the world have put afloat since the beginning of the war—$36,000,000,000. The paper money in existence in the 15 principal countries of the world at the beginning of the war was less than $8,000,000,000, and at the end of the war was over $44,000,000,000, an increase of $36,000,000,000 in 51 months, and this does not include any of the $80,000,000,000 worth of paper currency issued by the Bolsheviki in the 18 months of their control in Russia. Thirty-six billion dollars of new paper money added to the circulation of the world by 15 responsible governments in a little over four years.

We had been inclined to charge up the advance in prices occurring prior to the war to the fact that $8,000,000,000 worth of gold was turned out by the mines of the world in the 20 years following our famous gold and silver campaign of 1896. But here are $36,000,000,000 worth of paper promises to pay turned out as legal tender money by 15 responsible governments in a short four-year period. It is more, *in its face value* than all the gold and all the silver turned out by all the mines of all the world in the 427 years since the discovery of America.

True, much of this paper money is now more or less depreciated in its value as compared with gold, the world's accepted standard, but the fact that it has behind it not only a certain amount of the yellow metal but also the pledge of the governments by whose authority it was issued renders it at least an acceptable medium of exchange in the countries of its origin, while the fact that nearly every neutral country of the world has meantime increased its paper currency and national indebtedness, permitting its gold to pass from circulation into the vaults of its banks as a security for the paper circulation, tends to widen the field affected by this inflated currency.

Increase in Other Governmental Obligations

In addition to these vast sums of legal tender currency turned out by 15 responsible governments of the world, these same governments have at the same time made an even more spectacular advance in their issue of another series of promises to pay, which, while not legal tender in the ordinary sense of the term, do form a more slowly moving mass of currency. By this I mean the $180,000,000,000 worth of bonds or other forms of national obligations issued by the governments of the world in the past four years, for national debts of the world have advanced from $40,000,000,000 at the beginning of the war to $220,000,000,000 at its close. And while these bonds or other governmental promises to pay money at some future date are not legal tender currency in the ordinary sense of the term they do pass current in the financial world and prove a basis upon which money may be readily obtained by their holders and to this extent are an addition to the world's circulating medium.

Bank Deposits Greatly Increased

Still another increase in circulating media is found in the enormous growth in bank deposits, which of

itself increases circulation through the increased use of checks, especially in countries such as the United States, where the check forms so large a share of the daily business transactions of the country. Bank deposits in 15 principal countries of the world have grown from $27,000,000,000 in 1913 to approximately $75,000,000,000 at the present time, the ratio of increase being about the same as that of currency.

These increases, in circulation, indebtedness and bank deposits, while occurring chiefly in the countries participating in the war, have also extended to many other countries, especially in Europe, where the six principal neutrals have during the war period increased their national debts $1,000,000,000, their note circulation over $1,000,000,000 and their bank deposits by about $1,000,000,000.

Thus in a short four and one-half-year period world paper money has increased $36,000,000,000, world evidences of national indebtedness $180,000,000,000 and world bank deposits nearly $50,000,000,000. Most of this enormous increase has occurred in "uncovered" paper. The gold mines of the world have turned out less than $2,000,000,000 worth of the precious metal during the war period and most of the world's gold, which formed 55 per cent of world circulation at the beginning of the war, has passed into the vaults of the governments or of their great banks as a basis for their paper currency, and now bears a relation of but about 20 per cent to the flood of paper money in circulation; and this proportion of gold to paper varies widely when the respective countries are compared.

Will the "Scarcity Demand" Terminate?

We come now to the third and final question, that of prices of to-morrow. May we expect a material reduction in general prices in the near future? And in trying to determine this we must see whether the causes which brought about the advance during the war period are likely to be removed.

The chief causes of the advance seem to have been the "scarcity demand," the higher cost of labor, and the increase in circulating media. The "scarcity demand" came on the very first day of the war, for most of the countries entering that struggle found that the demand upon them would be far in excess of their supplies either of foodstuffs or military requirements and as the weeks and months and years progressed this fact was more strongly impressed upon them.

During the closing year of the war the ammunition factories of the various participating countries were able to meet to a great extent the requirements of their own armies, but in the matter of foodstuffs the "scarcity demand" still continues, with little prospect of abatement, at least in the near future. The number of mouths to feed in Europe has not decreased and that continent, which has not for many years been able to produce its own requirements of foodstuffs, now finds itself with neglected soils, a disordered population and unable to return to normal production in the immediate future. In manufacturing materials, for which Europe has also been dependent upon other parts of the world, she will require abnormally large quantities at least in proportion to her attempts to manufacture, for her stocks of this class of merchandise are absolutely exhausted. In all parts of the world which have relied upon Europe and the United States for manufactures the shelves are empty and must be filled, and most of the manufacturing sections of Europe will evidently be slow in resuming the production of manufactures for exportation, and will have limited facilities for transporting or marketing them even if produced. So it seems that, although the demand for war material has terminated, the other features of the "scarcity demand" will continue, at least in a somewhat modified form, in the immediate future, especially as relates to world requirements of food, manufacturing material and manufactures, while developments thus far do not point to an early reduction in labor costs.

Will the Over-Supply of Currency Be Reduced?

If we are right in assuming that a considerable proportion of the world advance in prices is due to the enormous increase in world currency can we expect a marked reduction in prices until the cause, "inflation," is removed? Or, to put it in another form, that part of the advance caused by inflation can only be cured by deflation, by a reduction in the enormous stocks of currency which, as I have shown you, have trebled during the war, while that other form of slowly moving currency, governmental obligations, has quintupled.

Is it probable that these two forms of currency can be or at least will be reduced in the near future? The governments of the world, which were paying less than $2,000,000,000 a year of interest on national debts at the beginning of the war, are now paying and must continue to pay a total of over $10,000,000,000 a year in interest, and at the same time all other expenses of governments have advanced. Official estimates of the "budgets" or expense accounts of several of the principal countries for the coming fiscal year have already been announced and indicate that their necessary expenses in the first full year of after-war peace will be about four times as great as in the year preceding the war. The British budget for next fiscal year is estimated at about six times as much as in 1913 and those of France, United States and Canada about four times as much as before the war. Present indications are that the governments of the world will be compelled to collect in taxes from their people about $50,000,000,000 a year as against about $12,500,000,000 in 1913, or say $1,000,000,000 a week as against $1,000,000,000 a month before the war, and this does not include anything for "sinking funds" or other provision for reduction of outstanding debts. If this be true is it probable that the governments in those countries which have greatly increased their circulation and must now demand such enormous increases in annual payment of taxes will find it advisable or possible to reduce materially the amounts of currency available for such payments?

If the governments which have been the chief participants in the world increase of currency should fail to reduce materially that excessive supply, and if the world's demand for food, manufacturing material and manufactures is to continue at the present rate, are we justified in expecting a general reduction in prices in the near future? The question I think answers itself. There will be, of course, instances in which there will be material reductions, but in general terms the outlook for marked or rapid decline, at least in the near future, does not seem encouraging.

Annual Meeting of American Association of Engineers

The American Association of Engineers will hold its annual meeting at the Hotel La Salle, Chicago, May 12 and 13.

Its relation to other societies is to be discussed on the morning of May 12, covering the following topics: Local and state societies; national societies; Engineering Council; Engineering Institute of Canada. On the afternoon of May 12 Prof. Frederic Bass, University of Minnesota, is to deliver an address on "How Shall the Curricula of Engineering Colleges Be Modified to Meet Modern Conditions?"

The sessions on Tuesday, including a dinner in the evening, are devoted to "Proper Compensation of Engineers" and "New Field and Opportunities for Engineers," and Prof. Walter Dill Scott will address the dinner on "Fitting the Engineer to His Job."

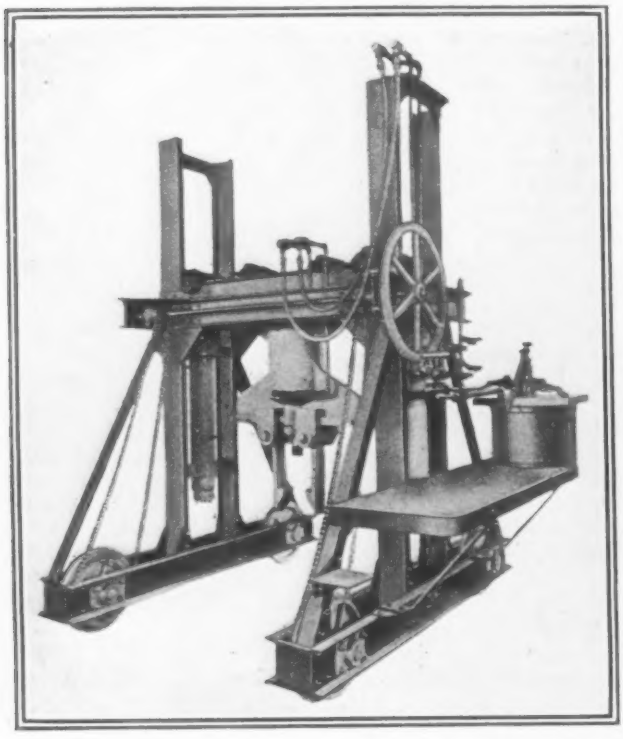
The Trumbull Steel Co., which recently secured control of the Liberty Steel Co., will build a railroad from its Warren, Ohio, plant to its newly acquired property near Leavittsburg, Trumbull County, about two miles distant. Necessary right-of-way has been purchased. Motive equipment will be obtained and bars and billets transported direct from the open-hearth works to the Liberty mills.

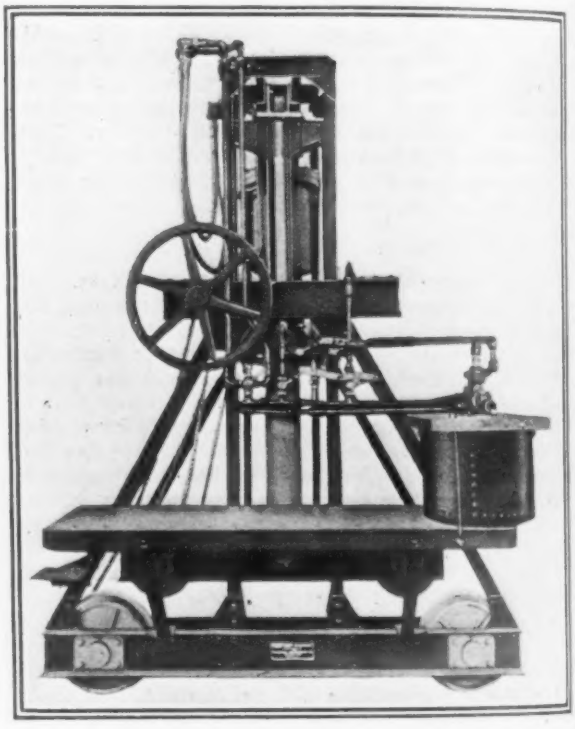
The Fulflo Pump Co., Blanchester, Ohio, manufacturer of lubricating pumps, etc., has established a district office and branch supply house at Chicago, in charge of R. E. Manly, of the Manly Sales Co., 6253 Ellis Avenue.

HYDRAULIC INGOT STRIPPER

A Special Self-Contained Device Operated by Hand Power

An ingot stripper, especially designed for stripping small ingots in steel plants, has been patented and put on the market by T. W. Price, president T. W. Price Engineering Co., Woolworth Building, New York. In plants casting small ingots or small tonnages of large ingots it has often been found impracticable, because of the initial cost and high operating and maintenance charges, to use the regular stripper cranes used when large ingots are cast in quantity. It is common practice in stripping small ingots to swing the mold and ingot by means of an overhead crane and allow them to strike violently against some heavy stationary object. Some steel plants have resorted to the use of split molds, which, in addition to being considerably more expensive, require time and attention to set in place. The split edges of these molds must be carefully machined from time to time in order that they will properly fit together.





An Hydraulic Stripper for Small Ingots, Hand-Operated, Designed to Travel on Rails. This machine does away with practice of swinging ingot on overhead crane to knock off the mold

The TWP hydraulic ingot stripper may be either fastened to a steel framework suspended from an overhead crane, or, better yet, mounted on a truck, as shown in the illustrations. The stripping portion of the apparatus consists essentially of a hydraulic cylinder to which is attached two tong arms for seizing and holding the lugs at the top of molds. The tong arms are adjustable sidewise to accommodate the different sizes of molds. Moving inside of the hydraulic cylinder is a piston at the lower end of which is attached a plunger for engaging the ingot. When the hydraulic force is applied to the cylinder the piston presses downward on the ingot and the tongs pull upward on the mold, thus effecting the stripping action required. In order to provide for different heights of ingot molds and in order to raise and lower quickly the entire stripping portion of the apparatus, it is mounted on a steel framework, the ends of which are fastened to smaller secondary pistons enclosed in two hydraulic cylinders, fastened on each side of the truck.

The primary large single stripping cylinder and the two smaller secondary raising cylinders are both connected to a standard hand-power hydraulic pump, which applies the required hydraulic force to either the stripping cylinder or the two raising cylinders, as desired, by opening and closing two control valves. The dead or discharged water from both the stripping and raising cylinders is stored in a small tank at one end of the truck platform. The truck supporting the stripper is mounted on four roller-bearing wheels and is moved on the tracks by the operator, standing on a platform attached to the truck, by means of a large hand wheel which drives two of the four wheels through a chain mechanism.

The single operator required moves the stripper from mold to mold. By turning one valve or the other he applies the hydraulic force for stripping or raising by moving the pump handle up and down. The operator can move the truck at the rate of 50 ft. per min., raise the apparatus at the rate of 30 ft. per min., and strip the mold from the ingot in 5 sec. The stripper is not intended, in most cases, to remove the mold entirely from the ingot, but simply to effect the stripping. The crane usually follows the stripper and lifts off the molds.

In cases where the ingots are poured large end up, a small hollow knob is cast on the side and at about the center of the mold, and by means of special tongs suspended from the crane hook engaging these knobs the ingots are upended before stripping, which, of course, is necessary in all events.

The stripper is designed in two sizes, which are designated as No. 1 and No. 2, the former being capable of exerting a hydraulic stripping force of 60,000 lb., or sufficient to strip an ingot up to 15 in. square, and the No. 2 of exerting a hydraulic stripping force of 150,000 lb., or sufficient to strip an ingot up to 30 in. square. There has also been designed an electrically operated stripper which is suspended and controlled from the crane. The basic principle of this device is the same as for the hydraulic stripper. These strippers are made in standardized form.

The Southern California Iron & Steel Co., Los Angeles, Cal., is planning to build a new plant about five miles south of the city. Its present works in the city include open hearth furnaces and steel rolling mills, and a part of the products in addition to steel bars, takes the form of bolts, nut and rivets. A. C. Denman, Jr., is president and general manager.

The West Penn Power Co. contemplates the erection of a large power plant at Springdale, Pa.

Government Will Sell Surplus Material

Iron and Steel and Scrap Will Be Disposed of According to Plan Agreed Upon at Conference—Representatives of Trade Papers Consulted—Organization Being Perfected

WASHINGTON, April 29.—Approximately 600,000 tons of iron, iron and steel scrap and semi-finished and finished steel will be disposed of by direct sale, under sealed bids, as the result of the conferences which were held last week between representatives of the sales division of the War Department, of the steel companies, and of the scrap iron dealers. This represents the War Department's surplus of these products. The final inventories proved less than earlier estimates.

The sales will be made through the various district offices of the department. It was agreed at the meetings that the amount to be sold was not large enough to threaten a serious effect upon general market prices.

The following steel company representatives attended the conference of the War Department officials and the steel producers:

United States Steel Corporation—J. B. Bonner.
Carnegie Steel Co.—H. F. Knapp and C. McKillips.
Bethlehem Steel Co.—Paul Mackall and E. R. Leonard.
Midvale Steel & Ordnance Co.—R. L. Battiger and Joseph B. Kind.
Jones & Laughlin Steel Co.—R. T. Rowles.
Republic Iron & Steel Co.—C. I. Starrett.
Lackawanna Steel Co.—E. Armstrong.

At the meeting with the dealers the following represented the American Board of Scrap Iron Dealers:

C. A. Barnes—Secretary American Board of Scrap Dealers.
Eli Joseph—Joseph Joseph & Brothers Co., New York.
F. Reese Phillips—Perry, Buxton, Doane Co., Philadelphia.
W. F. Hitner—Henry A. Hitner Son's Co., Philadelphia.
Joseph Hyman—Hyman & Michaels Co., Chicago.

Plan for Disposing of Steel

The meeting with the dealers was held on Thursday and with the producers on Friday. After the sessions the following statement was given out concerning the way in which the Government will dispose of the steel on hand:

It was deemed advisable to call such meetings that the Government might obtain the views of the leading representatives of the steel industry, in order that their ideas might be utilized in formulating a policy for the disposal of the Government's surplus iron and steel. The Government officials reiterated the statement that they wanted to sell in such a way as to effect industry least and at the same time realize the maximum return for the Government.

It was the consensus of opinion of both meetings that all steel and steel scrap material should be disposed of by means of sealed proposals, which should be accompanied with a certified check for 20 per cent of the amount of the bid made, which amount would be applied against the last shipment, intermediate shipments being made sight draft bill of lading. Such methods are in their opinion productive of the best results to the Government and one that is eminently fair to all bidders. As a result of a discussion as to whether or not sales should be made "on ground" or "f.o.b. cars," the latter arrangement was determined upon as the best for the Government to follow, for by so doing more bids would be secured and at more favorable prices, for an out-of-town bidder would not know how much it would cost to place the material on cars, and without such information would not be in a position to make an intelligent bid.

When acquainted with the totals of not only scrap, but of semi-finished and finished material as well, it was conceded that the entire quantity was very much smaller than had been anticipated. For the purpose of comparison it was reported that the country consumed in 1916 about 12,000,000 tons of purchased scrap, so the present surplus of approximately 605,000 tons would represent but a small percentage of the 1916 consumption.

Surplus on Hand

The following is the statement of surplus iron and steel which was submitted to the conferences:

Raw Materials:

(a) Iron ore—None reported.
(b) Pig iron—5,587 net tons, probably No. 2 Foundry.
(c) Ingots—42,272 net tons, 0.45 to 0.65 carbon (0.47 min. and 0.56 max. carbon reported).
0.50 to 0.90 manganese (0.60 min. and 0.80 max. manganese reported).
0.06 phosphorus and sulphur (0.032 min. and 0.05 max. reported).
0.10 to 0.35 silicon (0.12 min. and 0.20 max. reported).
90 per cent tonnage represents small slug for 9.2 in. shell forgings.
(d) Spiegel—37 net tons.
(e) Ferromanganese—None reported.
(f) Ferrosilicon—12 net tons.

Semi-Finished Products:

(a) Billets—114,533 net tons—Analysis same as ingots. 15 per cent tonnage 82 mm. (3¼ in.) round, the balance from 4½ in. to 6 in. squares, cut to length.
(b) Forgings—261,362 net tons—Analysis same as ingots. Range in size from 75 mm. (12½ in. long, 3.4 in. diameter, 0.4 in. wide, 21 lb.) to 155 mm. (24.6 in. long, 6¾ in. diameter, 8 in. wide, 162 lb.
(c) Alloy steel—2205 net tons—Mostly nickel steel, averages 3½ per cent nickel.

Finished Steel:

(a) Rails—400 net tons.
(b) Bars—112,376 net tons, merchant bars, standard sizes, lengths and analyses.
(c) Bars—10,309 net tons, standard cold rolled, rounds, squares and flats.
(d) Plates—40 net tons, standard analyses.
(e) Sheets—8,206 net tons, standard analyses, stock sizes, 90 per cent black, 5 per cent blue annealed, 5 per cent galvanized.
(f) Bands—None reported.
(g) Shapes—500 net tons, structural steel, standard analyses.
(h) Hot rolled—1365 net tons, standard analyses, standard sizes.
(i) Pipe—378 net tons, black, standard but miscellaneous sizes.
(j) Tool steel—1911 net tons, standard sizes, carbon and alloy not given.
(k) Reinforcing bars—1300 net tons, standard lengths.
(l) Wire—Black and galvanized—8975 net tons.

Cast Iron and Steel:

(a) Cast iron—2022 net tons, No. 1 cast.
(b) Cast steel—128 net tons.

Scrap:

(a) Machine borings and turnings—1737 tons.
(b) Steel, heavy melting—4373 tons.
(c) Nickel steel, heavy melting—10,053 tons.
(d) Nickel steel, boring and turnings—1539 tons.
(e) Cast and malleable iron—484 tons.
(f) High speed B & T scrap tools—83 tons.
(g) Miscellaneous mixed iron and steel—1239 tons.
(h) Low phosphorus—3847 tons.
(i) Iron and steel scrap—P. & S.—7962 tons.
Total scrap, 31,317 tons.
Grand total, 605,235 tons.

Perfecting the Organization

In the meantime the War Department has been revising the organization for the disposition of surplus property as well as the general policies concerning its disposal. The new organization will be completed sometime during the week. C. W. Hare will remain as Director of Sales and E. C. Morse will be his chief assistant. As already announced in THE IRON AGE, Charles E. Hildreth will be in charge of the machine tool section.

The chief effort to expedite the disposition of this surplus property centers in the organization of a new sales promotion section headed by T. R. Elcock, Jr., of New York. The first step in the organization of this section was a conference held by Mr. Hare with a committee representing the trade papers of the country. The War Department has decided that these offer the best method of reaching the industries most vitally concerned in the disposition of the War Department's sur-

plus. The trade papers were represented at this meeting by Mason Britton, chairman, general manager *American Machinist;* A. C. Pearson, president Associated Business Papers, secretary United Publishers Corporation (24 papers); V. E. Carroll, chairman New York Editorial Conference; A. I. Findley, editor-in-chief THE IRON AGE; David Beecroft, editorial director Class Journal Co. (seven automobile papers); Jesse H. Neal, secretary of committee, secretary Associated Business Papers.

There were also present at this conference: E. C. Morse, the assistant director of sales; T. R. Elcock, Jr., chief of sales promotion section, and L. G. Chapin.

Through Mr. Neal the War Department gave out the following statement of the result of the session:

Mr. Hare explained that the War Department would continue to dispose of its surplus in the future as it had in the past, namely by first consulting with the various branches of the Government as to what, if any, material declared surplus by the War Department could be made use of by them to fill their requirements. After their requirements had been filled, the producers of the commodity to be disposed of would be called into conference and consulted as to the best method to adopt for the sale of this commodity within a reasonable period of time.

If, as has been the case in the disposal of copper, sulphur, lead, wool and lumber surplus, the industry was able to contract with the Government to dispose of its surplus within a reasonable period of time, paying the Government current market prices therefor, such an arrangement would be made. When this was not possible, the surplus property would be offered to the public through auction sales, or by sealed bids, or in any other manner which will enable the Government to secure the best available prices for the commodity after due publicity.

It will be the duty of the Sales Promotion Section of the Sales Department, under the supervision of T. R. Elcock, to collect all information pertaining to sales of surplus property and to offer every facility to the trade journals to secure desired information in regard to the selling activities applying to any particular industry.

The surplus property sold in this country from Jan. 1 to April 18 has reached $156,083,166.25. This represents 91 per cent of its original cost. In the week ending April 18, $16,485,773.64 was received for material sold. The total sales for the year to date include $68,993,837.49 worth of railroad rolling stock.

The Ordnance Department has completed a revision of the material which it is now proposed to complete. One-half of the remainder is artillery. This is chiefly due to the fact that artillery production is the most difficult to commence and the longest in process. For these reasons there is also a greater sacrifice whenever artillery contracts are cancelled.

Special contracts have been made by the War Department to dispose of War Department surplus stock of sodium nitrate, sulphur and copper. This material will be sold by the firms contracting with the War Department at current market prices. Any one desiring to purchase part of this material is asked to communicate direct with the following named companies:

Sodium nitrate—W. R. Grace Co., Wessell Duval & Co., and H. S. Baker Co. of New York, and the DuPont Nitrate Co., Wilmington, Dela.

Sulphur—Union Sulphur Co., New York.

Copper—United Metals Selling Co., New York.

This material will be sold by these companies over a period of time and will not be dumped on the market in a way that would change to the slightest degree by its sale, the market price or market conditions.

O. F. S.

Offices of the Consolidated Coal & Coke Co. have been removed from the Oliver Building, Pittsburgh, to Uniontown, Pa. The Pioneer Coal & Coke Co., sales agent for the above-named concern, will continue to represent it with offices in the Oliver Building.

Offices of the Union Coal & Coke Co., subsidiary of the Midvale Steel & Ordnance Co., formerly located in the Oliver Building, Pittsburgh, have been removed to Bentleyville, Pa., where the coal and coke mines of the company are located.

STEEL RAIL PRODUCTION

Statistics of American Iron and Steel Institute Show Decrease from 1917

The production of rails in the United States in 1918, according to the statistics which have just been announced by the American Iron and Steel Institute, amounted to 2,533,675 gross tons, compared with 2,944,161 tons in 1917.

The production of rails by processes declined 15.44 per cent as to open-hearth in 1918 compared with 1917; 7.34 per cent as to Bessemer, and 14.65 as to all other processes.

PRODUCTION OF RAILS BY PROCESSES, IN GROSS TONS.

Years.	Open-hearth.	Bessemer.	Rerolled.*	Electric.	Iron.	Total.
1902	6,029	2,935,392	.....	.....	6,512	2,947,933
1903	45,054	2,946,756	.....	.....	667	2,992,477
1904	145,883	2,137,957	.....	.....	871	2,284,711
1905	183,264	3,192,347	.....	.....	318	3,375,929
1906	186,413	3,791,459	.....	.....	15	3,977,887
1907	252,704	3,380,025	.....	.....	925	3,633,654
1908	571,791	1,349,153	.....	.....	71	1,921,015
1909	1,256,674	1,767,171	.....	†	.....	3,023,845
1910	1,751,359	1,884,442	.....	†	230	3,636,031
1911	1,676,923	1,053,420	91,751	462	234	2,822,790
1912	2,105,144	1,099,926	119,390	3,455	.....	3,327,915
1913	2,527,710	817,591	155,043	2,436	.....	3,502,780
1914	1,525,851	323,897	95,169	178	.....	1,945,095
1915	1,775,168	326,952	102,083	.....	.....	2,204,203
1916	2,269,600	440,092	144,826	.....	.....	2,854,518
1917	2,292,197	533,325	118,639	.....	.....	2,944,161
1918	1,938,226	494,193	101,256	.....	.....	2,533,675

* Rerolled from old steel rails. Included with Bessemer and open-hearth steel rails from 1902 to 1910 inclusive. † Small tonnages rolled in 1909 and 1910 but included with Bessemer and open-hearth rails for these years.

Girder and high T-rails for electric and street railways are included in the totals. The production in 1918 for these rails was only 20,834 tons, compared with 91,674 tons in 1917, 127,410 in 1916, 133,965 in 1915, 136,889 in 1914, and 195,659 in 1913.

The total production includes rails rerolled from defective rails and from old rails, the tonnage of re-

PRODUCTION OF RAILS BY WEIGHT PER YARD, 1902-1918.

Years.	Under 45 pounds.	45 and less than 85.	85 and less than 100.	100 pounds and over.	Total Gross tons.
1902	261,887	2,040,884	645,162		2,947,933
1903	221,262	1,603,088	1,168,127		2,992,477
1904	291,883	1,320,677	672,151		2,284,711
1905	228,252	1,601,624	1,546,053		3,375,929
1906	284,612	1,749,650	1,943,625		3,977,887
1907	295,838	1,569,985	1,767,831		3,633,654
1908	183,869	687,632	1,049,514		1,921,015
1909	255,726	1,024,856	1,743,263		3,023,845
1910	260,709	1,275,339	2,099,983		3,636,031
1911	218,758	1,067,696	1,536,336		2,822,790
1912	248,672	1,118,592	1,960,651		3,327,915
1913	*270,405	†967,313	2,265,062		3,502,780
1914	*238,423	†309,865	868,104	528,703	1,945,095
1915	*254,101	†518,291	742,816	688,995	2,204,203
1916	*295,535	†566,791	1,225,341	766,851	2,854,518
1917	*308,258	†882,673	989,704	763,526	2,944,161
1918	*387,907	†665,165	888,141	592,462	2,533,675

* Includes rails under 50 pounds. † Includes 50 pounds and less than 85 pounds

newed and rerolled rails in 1918 amounting to 134,014.

The statistics as to the production of alloy-treated steel rails show that in 1918 only 3111 tons were rolled as compared with 16,535 in 1917. The production of this class of rails has steadily declined since 1910, when the production amounted to 257,324 tons.

The ore-hauling problem of the Phillipsburg Mining Co., Phillipsburg, Mont., was solved by the installation and operation of three caterpillar tractors. By this method of transportation the company has been able to overcome the handicap of bad roads and successfully move its ore from the mine to the shipping point. Each of the tractors handles six 35-ton wagons of manganese ore to a load, and hauling is done by day and night shifts throughout the year.

Railroad Men May Meet Steel Producers

Industrial Board Still Hopes That Price Stabilization Plan May Succeed, but Much Doubt Is Expressed by Others at Washington

WASHINGTON, April 29.—Another effort to find a basis for steel prices acceptable to the Railroad Administration is to be made by representatives of the Railroad Administration and the steel producers, provided the latter accept an invitation of the Industrial Board for further negotiations. Wages are to remain untouched, and the "average independent producer" is to be safeguarded.

This seems to put the whole matter up to the steel producers. After another week of negotiation the Industrial Board believes that a solution of the tangle over steel prices can yet be found. Despite the gloomy atmosphere in Washington concerning the prospects of effective intervention on the part of the Industrial Board, the promoters of the latter still cling to the belief that their price stabilization scheme can be put into effect. The week has been taken up by a lot of correspondence, and ends with Director General Hines somewhere in the Rocky Mountains, while Secretary Redfield of the Department of Commerce, and Chairman Peek of the Industrial Board, are in St. Louis to plead their cause before the United States Chamber of Commerce. If a meeting of the railroad men and the steel producers is finally held it will probably take place in Washington Thursday or Friday. By that time Director General Hines is expected to be back in Washington, and Messrs. Redfield and Peek will also have returned.

In the meantime, the other members of the Industrial Board are making no comments on the situation, although they assert an optimistic expectancy that the new conference will be successful.

The acceptance of the Industrial Board's suggestion to bring together the representatives of the Railroad Administration and the steel producers is the direct result of the cablegrams sent by President Wilson to Secretary Redfield and Director General Hines. These arrived early last week. Messrs. Redfield and Peek immediately started correspondence with Director General Hines, and gave out the letters and telegrams. Nothing was heard from Mr. Hines, however, until yesterday, when, at Denver, he gave out a telegram accepting the suggestion of the Industrial Board.

No one in official circles in Washington pretends to know what the steel men will do. The latter, however, have been so patient in the preceding negotiations that it is generally expected that they will again accept a suggestion to meet the Government representatives.

Program Not Outlined

Nor has there been any suggestion concerning a program for such a conference. Apparently not even the members of the Industrial Board would attend the session, leaving the conference to the steel men and the railroad representatives. If that interpretation of Mr. Hines' acceptance is correct the steel men would have little to hope for from the sessions. There is nothing to indicate that any such conference could have any effect on general public buying or on the stabilization of prices in the open market. How it can stimulate business in general no one here seems able to guess.

In the meantime, the Government departments are not buying steel. The Navy Department is still holding up the award of 20,000 tons of steel sheets and plates for the four new battleships, although the bids were opened April 4. The division of inland waterways of the Railroad Administration has taken no further step to award contracts for the purchase of 6000 tons of steel for barges. These were opened April 7 and sent out to Mr. Hines for his personal handling.

It is difficult to secure a Government estimate on the labor situation, which originally caused Secretary Redfield to boom the Industrial Board scheme. At that time the tide of unemployment ran high, and the winter weather caused special fears concerning labor unrest. The advent of spring has opened new fields of employment, although construction is still far behind normal. A new fear of general unrest, not unmingled with threats of Bolshevism, grows out of the uncertainty of the Paris conference and the growing seriousness of labor conditions in England. It is this that is causing the administration leaders in Washington to overlook nothing that might help to get industry into better shape to keep labor employed.

Chairman Peek Writes Director Hines

As the result of the Presidential cablegrams, Judge Robert S. Lovett, Henry Walters, and George Yeomans, representing the purchasing department of the Railroad Administration, met with Chairman Peek and the other members of the Industrial Board last Thursday. They failed, however, to reach a definite understanding. Messrs. Lovett, Walters and Yeomans made a formal report to Director General Hines as to the result of the meeting. At the same time, Chairman Peek sent a letter to Director General Hines defining the position of the Industrial Board, and making the formal offer to induce the steel producers to meet the railroad representatives "on the broad basis of the maintenance of the existing wage scale and the preservation of the average independent purchaser." Mr. Peek also sent a copy of this letter to Messrs. Lovett, Walters and Yeomans. In this letter Mr. Peek wrote in part:

> The President has referred to our board "as a court of mediation between buyer and seller." We, therefore, must decline to take a partisan attitude and in the absence of new information or data to urge the steel manufacturers to make a reduction in the offered prices, merely because the Railroad Administration requests it.
>
> If, however, you have any facts, figures or information showing that, on any ground whatsoever, the price recommended was too high, we shall be glad to approach the representatives of steel producers again and attempt to secure a modification of their offer in accordance therewith.

At the same time Secretary Redfield gave out a telegram which he had sent to Director General Hines, in which he said in part:

> You are cordially requested to ask your representatives to confer anew with the Industrial Board with the spirit on both sides of gentlemen engaged in a common service, seeking a mutual end, speaking without reserve and with entire absence of bargaining and without thought of maintaining previously expressed opinions save so far only as facts may when fully developed justify. I assure you in advance that the Industrial Board will act in this spirit.

Railroad Administration Explains

Nothing was given out by Secretary Redfield or Mr. Peek before they left for St. Louis concerning the reply from the Railroad Administration. Yesterday, however, the offices of the Railroad Administration in Washington gave out the following telegram from Denver, detailing the reply of Director General Hines:

> On April 26, Secretary Redfield telegraphed Director General Hines suggesting that representatives of the Railroad Administration confer anew with the Industrial Board relative to steel prices with the spirit of being engaged in a common service and seeking a mutual end. Director General Hines today called attention to the fact that on April 24 Judge Robert S. Lovett and Mr. Henry Walters, as representatives of the Railroad Administration, had met with the Industrial Board for the purpose of reaching common ground in a practical sense regardless of former conceptions on either side and had been prepared to offer compromise suggestions looking to an agreement as to prices, but that the board declined at the meeting to act except according to its original conceptions, which in the opinion of the Director General were erroneous, and that this attitude of the

board practically closed the door to further discussion at that meeting.

The Director General in view of the renewed suggestion for conference indicated a willingness to accept the offer made by the Industrial Board in a telegram sent by Chairman Peek on April 26 to bring together representatives of the Railroad Administration and the steel producers.

Mr. Peek's address before the United States Chamber of Commerce in St. Louis went in great detail into the history of the organization of the Industrial Board and its conferences with the Railroad Administration. The only new item concerning its original organization, which Mr. Peek made public, was to specify that the cabinet officers who were interested in the original project besides Secretaries Redfield and Glass were Secretary Lane of the Interior Department, Secretary Wilson of the Labor Department, and Postmaster General Burleson.

Mr. Peek concluded his address with the following paragraph: "With reference to the question sometimes asked as to whether or not the board is engaged in price fixing, it may be said that inasmuch as it does no more than to announce what prices are fair and reasonable under all circumstances, and as low as may be expected for some time to come, it cannot be regarded as fixing prices in any sense."

Contractors Blamed for Slowness in Adjusting Claims

WASHINGTON, April 29.—Complaints from contractors that they have difficulty in collecting payments from the Government for contracts that were canceled or suspended after the signing of the armistice are met at the War Department by the statement that all such delays are due to the dilatoriness on the part of the contractors themselves.

"We are adjusting these contracts just as fast as they are presented," said Acting Secretary of War Crowell, who is also Director of Munitions, in reply to questions from THE IRON AGE. "None of our claim boards is working up to capacity. Somehow, it seems to be difficult to induce the contractors to file all their claims, but as rapidly as they are filed we shall push them to adjustment. I do not know why the contractors should hold back so long with their requests for adjustments.

"There have been some other delays in contracts presented for adjustment, but these have been due to the fact that the contractors have declined to accept the settlements offered, and then have failed to take advantage of the machinery provided by the law for appeals from our decisions. I do not believe the War Department should be held responsible for these delays. We are doing all we can to secure a prompt settlement of all claims and to expedite their payment."

Steel Corporation Buys Empire Building

The United States Steel Corporation has purchased the 21-story Empire Building, 71 Broadway, New York, for about $5,000,000, the largest real estate transaction of the year in New York. The corporation has been occupying a large part of the building for several years. The total area of the plot is 14,000 sq. ft. The building is convenient to the financial district and numerous transportation lines. Upon the completion of the building in 1898 it was the tallest skyscraper in the city, and its foundation, which consists of 23 steel caissons, was carried down 50 ft. to bed rock. The O. B. Potter Trust was former owner.

New Greaves-Etchells Furnace Installation

The Electric Furnace Construction Co., Philadelphia, reports a repeat order from the Ford Motor Co., Detroit, for a Greaves-Etchells electric furnace. The initial furnace was installed last year.

In England further orders have been secured for furnaces from Woodward, Gatty, Saunt & Co., Ltd., Birmingham, and G. & J. Weir, Glasgow.

THE LABOR SITUATION

Shortage in Workers at Detroit

Government representatives in Detroit are still reporting a surplus of labor in spite of the fact that they admit to the press there is a shortage—a shortage which industrial leaders place at between 14,000 and 15,000. The U. S. Employment Service in Detroit states that the fear of bringing to this city a flood of men from other communities before the placing of returned soldiers from this section—thousands of whom will be mustered out in the coming two weeks—has caused them to report a labor surplus. They state that the figures on unemployment are gradually being reduced in their reports to the Government; that they wish to make the reduction gradually.

The General Motors Corporation and other concerns are reported to have men in Ohio and other surrounding states contracting for labor at the present time. One company last week filed an application for 7500 additional men, which has not been filled.

Detroit's labor situation is complicated by the housing situation, there being no available homes in the city, and rents running high. To remedy this condition, industrial leaders of the city have formed a Community Housing Corporation, which will have a minimum capital of $1,000,000 and a maximum of $10,000,000, and will proceed at once with the erection of homes for workers.

Suggestions from Employees

The Republic Iron & Steel Co., Youngstown, Ohio, has inaugurated a policy of securing suggestions from employees that has proved successful. Throughout the plant, in conspicuous places, boxes are placed with the announcement that suggestions may be placed therein. Five prizes are awarded each month for the best ones, $25, $20, $15, $10 and $5. Any employee may make a suggestion that he thinks will expedite or improve work in his department. Several hundred such slips have been received by the management each month and many valuable ideas have been thus obtained.

In the Labor World

A strike of Italian employees of the Detroit Shipbuilding Co., believed to have been precipitated by the differences of the Italian and U. S. governments at the Peace Conference, has been settled by the promise of Federal mediation. The men demand higher wages and some refuse to work at all. A strike of employees of the Wadsworth Mfg. Co., Detroit, has not been settled despite the efforts of the Government mediators. The employees and the concern are in a deadlock, due to the fact that the former demand a committee to represent them which shall be picked by them, not only from their own concern but from others. With the exception of these two difficulties labor in Detroit is well employed and satisfied, and there is a general confidence that well established companies will experience no trouble.

The General Motors Corporation has started the erection of 1000 houses for its employees at Flint, Mich. The company will spend $4,000,000 in this work, and will sell the homes to its employees on easy terms.

An increase in pay from 55 to 72c. per hr. for toolmakers and from 50 to 68c. for machinists has been granted by the National War Labor Board to these workers at the Westfield Mfg. Co., Westfield, Mass. The increase is retroactive from Jan. 30 to last November. The applicants were not, however, awarded an 8-hr. day.

Last week in West Springfield, Mass., the employees of the Gilbert & Parker plant went on a 4-day week, but the subscribers for bonds while working on short time will not be asked to make payments on them until they get back to the full time pace once more. Stock has been accumulating so that a curtailment of product was deemed necessary to bring the surplus down to normal proportions.

Industrial Democracy a Leading Topic

National Metal Trades' Association Convention Discusses Important Questions of Labor and Capital—Addresses by Senator Watson, Secretary Redfield, and Members

INDUSTRIAL democracy was the dominant note in the annual convention of the National Metal Trades Association, held on Wednesday and Thursday, April 23 and 24, at Hotel Astor, New York. That the day is here for a new relationship between employer and employee was emphasized by many of the speakers. President John W. O'Leary in his opening address, stated that the officers of the association are "keenly alive to those tendencies toward what is generally termed industrial democracy," and some of the members went further in discussions which took place at the concluding session and spoke of the necessity of re-establishing closer relationship between employers and employees by means which will not smack of paternalism, but which will give workmen a greater interest in their work and a wider knowledge of the economic principles underlying industry. One member went so far as to say that the curse of the world has been selfishness, and in applying this to industry he said that both employers and employees have been selfish and that the industrial tendency of the present time is to think more of the other fellow's rights and welfare.

The 8-hr. day came in for its usual share of discussion, after which President O'Leary summarized the sentiment of the association as being that the establishment of hours of work is a matter for determination by the manufacturers in each district. He suggested that it was not desirable to suggest a uniform working period for the entire metal-working industry, and commented upon the fact that where workers have long rides to and from their place of work, as in large cities, a shorter day is more of a necessity to the workers than in small communities where a majority of the workers live within short distances of the shops.

The Officers Elected

Officers of the association for the next year were elected as follows:

President, John W. O'Leary, Arthur J. O'Leary & Son Co., Chicago; first vice-president, Murray Shipley, Trailmobile Co., Cincinnati; second vice-president, A. E. Newton, Reed-Prentice Co., Worcester, Mass.; treasurer, F. C. Caldwell, H. W. Caldwell & Son Co., Chicago; councilors for two years, Edward Kneeland, United Engineering & Foundry Co., Pittsburgh; Paul T. Norton, Case Crane & Engineering Co., Columbus, Ohio; M. B. McLauthlin, George T. McLauthlin Co., Boston; George O. Rockwood, Rockwood Mfg. Co., Indianapolis, Ind.; Justus H. Schwacke, Wm. Sellers & Co., Inc., Philadelphia; G. W. Kyburg, Package Machinery Co., Springfield, Mass.; councilor to fill unexpired term of A. E. Newton, C. W. Tremper, Tremper-Shields Co., New Haven, Conn.

President O'Leary's Address

President O'Leary in his opening address contrasted conditions as they existed a year ago with those that now face industry. He dwelt on the labor legislation and decisions which have brought about new conditions in the labor world and asked, "What shall be our attitude?" He stated that employers hear rumors of national labor policies to be pronounced by President Wilson on his return from Europe; one of which it is stated may be the promulgation of a national 8-hr. work day. "Because we disapprove of this program shall we resist only, or shall we do as in the past year?" Mr. O'Leary asked. Answering his own question he said, "With the experience that we have, it is far better in my opinion to co-operate and participate and endeavor to guide. It is not the part of wisdom to hide our heads in the sand when movements are under way which materially affect the future of our industry."

Mr. O'Leary summarized the new principles which have been brought into prominence in industry through decisions of the Government labor boards as nationalization of hours, wages and conditions of employment, group representation, uniform work day and profit-sharing. As to nationalization of hours, wages and conditions of employment, he stated that this is contrary to the principles of the National Metal Trades Association, but that the other three principles are receiving very earnest consideration and adoption by some employers. Regarding so-called industrial democracy, he said that the association approaches the subject with full knowledge of what experience has taught and he added: "We differ from those theorists who believe they can write a program which will apply to all industry and serve as a panacea for all our industrial problems. We realize fully that differing conditions require differing treatment; that the nature of the industry, its location and its size are all factors which should be considered. The difference between our method and that of theorists is that we are striving to develop relationships, fundamentally sound, while others are trying to create artificial methods which will react and make for greater disturbance later."

He reiterated the belief of the association that the best protection to the workers' future is the open shop, stating that a principle which is based on the Constitution of the United States has proven its soundness through 143 years and need not be abandoned now. He said it was important that economic principles be taught the working man in simple language. The worker, he said, is urged to insist upon a shorter work day, because he is told it will furnish more employment. The worker is also urged to restrict his output for the same reason. Mr. O'Leary said that the worker must be educated to see that this is fallacious reasoning. He concluded by stating that the association will continue to follow closely the daily trend of industrial affairs. But he expressed impatience with those who consider it necessary to rush into immediate settlement of all the processes of business life, permitting enthusiasm or sentiment to push them into action which may bring destruction or at least grief.

Commissioner Hibbard's Report

Commissioner John D. Hibbard, in his annual report, stated that the high water mark in labor disturbances among labor associations was reached in 1916, and each succeeding year has seen a decreasing number. During the past year only nine cases were reported, most of which were not serious, the only important case being that of the Wagner Electric Mfg. Co., St. Louis, involving some 3000 employees. At the present time there is but one member of the association having labor difficulties and his troubles, it is stated, are about over. Discussing present-day tendencies in industry, Mr. Hibbard said:

"For some considerable time questions involved in the shop relations between employer and employee have been assuming different characteristics from those so familiar to us, and various plans for the development of a closer, personal touch and relationship and in some cases profit-sharing, have been suggested and have actually been put in operation by some well-known employers. While we may or may not agree with the practicability or wisdom of any of these plans, or be in sympathy with them, we must admit the fact that they are forcing themselves to the front and demanding our attention, if not our decisions. Should we not, as representing those best qualified, give time and thought to the end that not only foolish, visionary and uneconomic proposals be rejected, but that wise and constructive suggestions be offered?

"The employer, unfortunately, in time gone by has been forced into or has allowed himself to be placed in

a false position. By every instinct, he is just as humane, just as patriotic, and just as much interested in the real welfare of the workers of this country as is any other citizen and is much better equipped to suggest practical remedies for some of our present ills, and while there may be exceptions, the average employer of to-day has a sense of his responsibilities and is earnestly and honestly endeavoring to fulfill them. He is, therefore, to-day seeking information as to the best and wisest courses of action to be adopted at this time.

"While all of this is undoubtedly true, we must not forget the lessons taught us by the war, one of which was that we are in a very much better position to carry out our proper ideals when we are prepared to defend ourselves and these ideals when attacked and, if necessary, to wage an aggressive warfare.

The Eight-Hour Day

"During the year there has been much discussion in regard to weekly schedules, and reports continually reach us that this concern or that has 'granted the 8-hr. day.' We hear that the President upon his return from the Peace Conference is to urge the general adoption of the 8-hr. day, and to some of our academic friends it continues to be the 'psychological work day'; notwithstanding all of which, at the present time, less than 10 per cent of our members are operating on the basic 8-hr. day and few, if any, on an actual 8-hr. day. Eighty-six and five-tenths per cent are still operating 54 hr. or more a week, single time and including a Saturday half-holiday in this schedule. There is, as always, much loose talk in the public discussion of this question, few apparently realizing that an 8-hr. day in a large city, with long transportation hauls, may be equivalent to a 9-hr. day in a smaller city. There are many other local and individual factors which would seem to make a universal 8-hr. day both unwise and unfair; besides all of which we have not as yet determined just what our economic conditions are to be after we have returned to a reasonably normal situation.

"As a union slogan, or as merely a means of providing more overtime, we are still opposed to the 8-hr. day and many of us are opposed to it for additional reasons.

"Those who changed their working weekly schedules to 8 hr. per day, 48 hr. a week, believing that by such action demands for further reductions in hours would be forestalled or prevented are now discovering—as was predicted—that the International Association of Machinists construes eight hours to mean a 44-hr. week; with this construction is also presented a demand for a 15-cent per hr. horizontal increase and double time for overtime.

Labor in Politics

"The recent formation of political parties in the different sections of the country by the labor unions is interesting. For years the American Federation of Labor and its allied unions have been able to exert considerable pressure on our State and Federal legislators because of the mystery of the number of votes which they claimed to have the power to influence. Mr. Gompers has always opposed the formation of a national labor party, possibly because he has realized that the formation of such a party would immediately indicate its political strength. We have recently had a practical example of organized labor in politics in the mayoralty contest in Chicago, where the unions' strength has been usually admitted, and in which, after a most active and systematic campaign to develop the greatest union strength possible at the polls, about 54,467 out of a total of 688,361 votes were cast for the labor candidate.

"The second chapter of this story is equally interesting. Immediately following the election, one of the largest and most powerful labor lobbies ever brought together went to Springfield in an attempt to force the passage of a State anti-injunction bill, labor's pet bill. One of the political parties, believing that the labor disaffection in Chicago had defeated its candidate, refused to support the labor delegates' attempt to pass the bill, giving as its reason that labor was now in politics and was playing its own game. The bill was defeated."

The report of Treasurer Frank C. Colowell showed the association to be in the soundest financial condition of its history and Secretary Homer D. Sayre reported a substantial gain in membership.

The committee on Industrial Education, members of which are Harold C. Smith, C. W. Tremper and F. C. Whitney, made a study of the vestibule plan of training workers and last fall visited several plants in Cincinnati and Dayton where this plan was in successful operation. The signing of the armistice seemed for the moment to remove the need for this particular kind of training, but upon reflection, the committee decided that the benefits of such training as a result of the war must not be lost in the competitive days of peace. Therefore, the committee has recently completed the tour of plants in Providence, Worcester, New Haven, Bridgeport, Stamford and Buffalo and has unanimously agreed as to the necessity of more intensive training in the metal industry. Training of workers is now carried on under five general plans:

1. Apprenticeship.
2. Trade and Continuation Schools.
3. Instruction by Foreman.
4. Special Training in Plant.
5. Vestibule Schools.

Industrial Education

Discussing these various methods of training the report contained the following conclusions:

The Apprenticeship System and *Trade Schools* have for their object the manual and technical training of boys and young men in a particular craft or trade which they may select. These methods have been covered by previous committee reports and it is the opinion of your present committee that their value has already been proven and we can only emphasize the desirability of each member training apprentices in proportion to the number of journeyman craftsmen employed and supporting the trade and continuation schools wherever they are in existence.

We desire to point out, however, that apprenticeship and trade schools are particularly designed to take care of young men who wish to learn a trade in all of its branches and are not generally adaptable to the instruction and upgrading of unskilled workers.

Instruction by Foreman. This is the system most universally employed and consists of putting the workmen directly into the department and under the supervision of the foreman in charge, who is entirely responsible for their success or failure.

The observation of your committee is that the particular objection to this method is that the foreman, being responsible for the success of his department, in a great many instances has not the time nor the patience to properly instruct the worker, nor the ability to impart his own knowledge.

There is also the possibility that prejudice on the part of the foreman may prevent him from properly instructing the worker in the performance of the required operations, the result being a lack of efficiency and consequent loss to both the employer and worker.

Special Training in Plant. This system, which consists of training in the department by a general instructor, has some of the advantages of the vestibule school and, in the opinion of your committee, is preferable to instruction by foremen.

Vestibule School. This plan came into prominence during the war. As the name implies, it is intended to be the worker's entrance to the factory, and while by no means supplanting apprenticeship, is adaptable in some form in every shop and goes far toward solving the problem of the shortage of skilled labor. It has been applied very largely to the intensive training of workers for repetition work, and has also been used to train specialists; such as operators of particular types of machine tools. To this school should be sent all accepted applicants, where their fitness or unfitness is determined. The length of time spent in the school depends upon the skill possessed at the start; their aptness as students and the character of work they are to be taught. Your committee found in the schools visited that the training time varies from three days to three months.

Many of the thousands of men and women from all walks of life trained to high efficiency as specialists in the vestibule schools during the war continue to retain their positions, and in numerous instances surpass in production workers trained under other systems.

A system so wide in its scope and so general in its application can be only outlined in this brief report. It must

also be remembered that local conditions will determine the adjustment of the course to the member's needs.

The committee is so strongly of the opinion that intensive training will in a large measure assist in successfully meeting the competition of the world that it has decided to recommend to your national executive committee the employment of a man especially qualified in this work, whose duty will be to further industrial training in the individual plants of the membership.

In the meantime, we would greatly appreciate receiving the individual expressions of our members as to their experience in the various forms of training which may already be established in their plants, and the desirability of our association becoming more active in carrying on a campaign for the intensive training of workers.

An Inspiring Address

Harry F. Atwood, author of "Back to the Republic," delivered an inspiring address on "Our Constitution, the Antidote for Bolshevism." He illustrated the points of difference between a democracy and a republic by saying that they have in Russia to-day a pure democracy, where the power comes up from the people, which, he said, would prove as unsuccessful a method of government as that form of autocracy which Germany had until recently, wherein power comes from the top. He stated that our own form of government is the golden mean between autocracy and extreme democracy, and he predicted that the constitution of the United States will ultimately be adopted in every country in the world. Mr. Atwood's address made such a favorable impression that he was flooded with requests to repeat it in various cities in the country before local associations of manufacturers.

At the afternoon session Wednesday, an interesting talk was delivered by Frank Jewel Raymond, East Orange, N. J., whose occupation is to forestall industrial unrest in manufacturing plants by what is popularly called "selling the men their jobs," or in other words, showing them their opportunities and instilling in their minds a belief in their jobs, enthusiasm for their work. Mr. Raymond told a great many business truths in a witty, epigrammatic style, and won frequent and spontaneous applause. He said that a manufacturing plant is known by the foremen it keeps, and many a plant, he added, is not running smoothly because of the dislike the workers have for their foremen. He emphasized the need for greater personal touch between management and employees. A cheery "good morning" was one thing, he pointed out, that many employers overlook. He urged that employers look upon their men more as human beings than machines. The only difference, he said, between men in industry at the top or at the botfom is how these men use the abilities and brains they possess.

Secretary Redfield on Business

Secretary of Commerce William C. Redfield, in discussing the work of the Department of Commerce and its relations to business, said that business men have been slow to appreciate the help that the Department of Commerce can give them. As an illustration of the work the department is doing, he stated that more than $50,000,000 worth of business a year is turned over to concerns that have enlisted the department's co-operation. He said that a large rubber company recently received an order for $100,000 worth of rubber goods, and a subsequent order for $250 000 worth, as a direct result of the work of the department's commercial attaché in Buenos Aires. The commercial attaché at Pekin, China, was instrumental in closing between $4,000,000 and $5,000,000 worth of business for a large American company.

The secretary said that the Bureau of Standards of the Department of Commerce has a rolling mill, steel furnace, and other equipment in Washington and is prepared to conduct experiments in almost any line of industry for the benefit of American manufacturers. There is, for example, the most complete equipment in the world for the manufacturing and testing of internal combustion engines. The department is prepared, he said, to take a problem from a manufacturer's shop and endeavor to solve it in the Government shops at Washington. The manufacturing company is at liberty to send its own men to Washington to assist in the work or the Department of Commerce will send its men to the manufacturer's own plant. As an example of some of the problems upon which the Bureau of Standards is working, Secretary Redfield referred to the work done in magnetic testing of steel to discover defects without the necessity of selecting samples and testing these to destruction as in physical testing apparatus. With the magnetic method it could be told in advance, for example, if a rail was about to break or if a machine part was about to give out.

Many Experiments

During the past few years the Bureau of Standards has conducted a large number of experiments in the manufacture of optical glass, chemical porcelain, dyestuffs and other products in which Germany formerly had almost an exclusive monopoly. When the war broke out, citizens were asked by the Navy Department to lend their binoculars to the Navy because the United States had, prior to that time, depended almost entirely on Germany for optical glass. Since then, however, through the efforts of the Bureau of Standards, the manufacturing of optical glass has been successfully developed in the United States and never again will Germany be able to dominate this industry. The same holds true of chemical porcelain and dyestuffs.

The Bureau of Standards has likewise saved manufacturers many thousands of dollars through devising methods of recovering waste products. Mr. Redfield told of one shell plant which during the war turned out about 100,000 shells which were found to be so far out of balance that they would not shoot straight. The problem was put up to the scientists in Washington after the shell company had concluded that the shells would have to be sold as scrap. But by electro-plating the lighter side of the shells the Bureau of Standards succeeded in restoring the balance and the shells became fit for use.

Another instance of the recovery of waste products that Mr. Redfield cited was costing a manufacturer many thousands of dollars a year because he had found no way to utilize paraffin paper waste. The Bureau of Standards worked up a method by which the paraffin could be recovered from the paper; and the paper was also saved.

Mr. Redfield stated that the Bureau of Standards has 1200 scientists and nine large buildings devoted to the scientific and practical problems of industry. In addition, the department has 60 men in Europe and 30 men in the rest of the world, plus the United States consular force, all of whom are engaged in developing business prospects for American manufacturers. He said that some members of the machine-tool industry sent representatives to Europe to find out true facts regarding the French and English embargoes; whereas this information was in the possession of the Department of Commerce and readily available. The department, Mr. Redfield said, is in hourly touch with all the markets of the world and is ready to turn over this information at any time to those whom it will interest. The work of the department is limited only by the funds at its disposal. When Mr. Redfield became Secretary of Commerce, six years ago he had an appropriation of only $60,000 a year for the development of American foreign trade. At present from $700,000 to $800,000 a year is being spent in this way. Mr. Redfield says that it is not enough, but that he has been handicapped by the indisposition of Congress to appropriate more. Great Britain, he said, is spending two and one half to three times as much for foreign trade development and the British Board of Trade is to adopt the American standards of work. The Canadian Government is spending $100,000 a year for moving pictures alone, which are shown around the world to advertise Canadian industries.

In other industries the Department of Commerce is doing similar important work. For example, as a result of its efforts to convince the public of the value of whale meat as food, about 30,000 cases of whale meat were consumed last year and 50,000 cases will be

canned this year. In the office of the Department of Commerce are shoes made from shark's skin and other fish skins, and the whole of the shark can be used for various purposes. The meat serves as excellent feed for chickens.

In closing, Mr. Redfield said he wished to disabuse the minds of business men of the idea that appointments in the Department of Commerce are made upon a basis of political preferment. He said that he does not know the politics of any of the heads of bureaus, nor does he care what their politics is so long as they do their work.

He suggested the appointment of a standing committee of the association to work with the Department of Commerce in foreign trade development and in research and experimental work. President O'Leary stated that this committee would be appointed.

Shipbuilding during the War

Howard Coonley, vice-president Emergency Fleet Corporation, gave some interesting statistics relating to the progress of the industry in the United States during the war. Before the war, the country had 235 shipways and the greatest output in one year was 285,000 deadweight tons. After 18 months of control of shipbuilding by the Emergency Fleet Corporation, the United States had, when the war ended on Nov. 11, 1100 shipways. From a nucleus of 47,000 skilled men the force of employees grew to 400,000 shipworkers, while the number of men in office and executive positions grew from 123 to 8100. More than 3000 separate items of equipment were required for the wood ships alone, and it was necessary to create new plants in many institutions to supply these accessories. The production of some items was stimulated to the point 10 times greater than was ever produced in this country before the war. Mr. Coonley said that the United States produced 3,103,000 tons of ships in 1918, in addition to which 2,540,000 tons of ships were in process of construction at the end of the year. The 1918 output was greater than the country's total output of ships in the 10-year period from 1907 to 1916 inclusive, and it exceeded by 25 per cent the combined output of the rest of the world for 1918. Mr. Coonley said that the Emergency Fleet Corporation expended $25,000,000 in taking over steam and electric railroads for the transportation of 125,000 workers a day. A housing fund of $75,000,000 was extended in constructing 8900 houses, 1100 apartment buildings and hotels and hundreds of dormitories. The Emergency Fleet Corporation was providing accommodations for 100,000 men in its own houses at the close of the war.

Before the war, the total allied and neutral ship tonnage, according to Mr. Coonley, was 59,000,000 tons. Losses from submarines and other causes amounted to 21,000,000 tons. During the same period, 14 000,000 tons of new shipping was put afloat and 3,700 000 tons of enemy shipping was commandeered. Thus, the total net loss was 3,300,000 tons at the end of the war. During this time, however, 14,700,000 tons of shipping was kept in service which, under normal conditions, would have been scrapped. Therefore, Mr. Coonley said, the net deficit in ship tonnage of allied and neutral countries is about 18,000 000 tons. He said that the shipbuilding industries of the United States would build about 5 000 000 tons this year and could have produced from 7,000 000 to 8.000 000 tons had it been necessary to do so. He predicted that by June, 1920, the United States would have a merchant marine second to none.

Wages in Shipyards

Discussing rates of wages paid in the shipyards during the war, Mr. Coonley said that many metal-working industries suffered because of the high wages paid in the shipyards. But he said that the shipbuilding industry needed skilled labor and that there was no other way but to go into the market and buy it at higher prices. He said it was unfortunate that the first case to come before the Shipbuilding Wage Adjustment Board for settlement was on the Pacific Coast, where wage rates are normally higher than in the East. Thus it was that the Shipbuilding Wage Adjustment Board fixed wage rates, which were considered too high for the East. Western employers, however, paid from 25 to 30 per cent above the scale fixed by the adjustment board. The Emergency Fleet Corporation attempted to prevent this and even threatened at one time to prevent shipments of steel to those yards by appealing to the War Industries Board. The second wage award affecting Pacific Coast workers was based on an advance in the cost of living of 12 per cent. By the time this was made, the West Coast shipbuilders had found that the Emergency Fleet Corporation did not reimburse them for the high wages paid, and therefore they began pulling their wages down to meet the scale fixed in the so-called Macy award. To the men in the shipyards, this seemed like a reduction in pay, and the result was the recent strike which was spectacularly ended by Mayor Ole Hanson of Seattle. Mr. Coonley stated that in his opinion the prompt checking of this strike saved the country from the worst conflagration it has ever faced.

In concluding, Mr. Coonley said that his experience in shipbuilding affairs had taught him the necessity of closer contact between employer and workmen. He said, "We must look at our workmen in a new way. At present they think of only two things, hours and wages." Mr. Coonley said that in his own company, the Walworth Mfg. Co., Boston, of which he is president, a new plan of industrial democracy is being put into effect. A conference committee has been appointed consisting of three men named by the management and three named by the men. Before this conference committee will be placed all questions of interest to management and employees.

Dr. Eaton on Industrial Democracy

Dr. Charles Aubrey Eaton, who recently tendered his resignation of his pastorate of a New York church to engage as counselor in industrial relations, and who served during the war for the industrial relations department of the Emergency Fleet Corporation, delivered an interesting and inspiring address on "Industrial Democracy."

"The old age is dead, we will never see it again," said Dr. Eaton. Drawing lessons from recent political events in Europe, Dr. Eaton said that autocracy as a system of life is dead and buried. He said that this applied as well to autocracy in industry as to autocracy in business. The law of the survival of the fittest is not the law of human life; but is the law of the jungle, he said, and was never intended by the Creator to apply to human relations.

Bolshevism, Dr. Eaton said, is the illegitimate child of Prussianism. It is Prussianism turned upside down. It starts with a tremendous handicap, he said, and will eventually fail. He based this prediction upon the fact that history has shown that no civilization has existed long when based upon one class, nor can any civilization or Government rest upon physical force alone, but must have a square basis in justice.

Dr. Eaton discussed Government ownership and control of public utilities, and said that the results of recent experiments in this country had created so much prejudice in the public mind that state socialism as an issue is dead for some time to come.

He said that henceforth industry cannot simply be a private enterprise, but must become a national service. Labor unrest is not a matter of wages alone; but the workman objects to being considered a mere machine and employers henceforth must regard his human rights. Dr. Eaton argued for more personal contact in industry. He said that what is the romance of business to the man of large vision in the executive office is merely a common grind to the workman at the bench. He said that the romance of the business could be instilled in the minds of the workmen by proper education. In closing Dr. Eaton predicted that America is about to enter the golden age of industrial advancement.

Senator Watson's Banquet Speech

At the banquet Wednesday evening, Senator James Watson of Indiana was the speaker. President John W. O'Leary was toastmaster. Senator Watson devoted a large portion of his remarks to the railroad question, and as a member of the Interstate Commerce Com-

mittee of the Senate, he stated his belief that the next Congress will return the railroads to their owners under some form of Government control and regulation. He urged the formation of a larger Interstate Commerce Commission with divided duties, one-half of the commission to deal exclusively with administrative affairs and the other half to deal with judicial decisions. Senator Watson likewise intimated that the next Congress would insist upon return of the telegraph and telephone companies and the express companies to their owners.

The Thursday morning session, which concluded the convention, was given over to informal discussion of present industrial tendencies. Under this heading, the plan of representation of employees which has been inaugurated by many companies was thoroughly discussed, and the keen interest of many manufacturers in this suggestion was indicated by the considerable number of members who were observed to be taking notes during the discussion.

The Multigraph Company's Plan

R. G. A. Phillips, treasurer American Multigraph Co., Cleveland, told of the plan which was inaugurated the first of this year by his company, whereby employees of the plant have a full voice in the affairs of shop management through a system of representation patterned after that provided in the constitution of the United States. A complete description of this plan was published in THE IRON AGE of March 20, page 743. Mr. Phillips stated that since the plan was inaugurated the company has received 30 or 40 requests a day for further information regarding it, many of these coming from foreign countries. He said that the complete plan has been published in booklet form and any manufacturer can obtain a copy upon request. While the plan has not been working long enough to give it a thorough trial, Mr. Phillips was convinced that it would prove successful in re-establishing that intimate personal relationship between management and men which at one time prevailed in nearly all plants. He said further that he expected that it would counteract the pernicious influence of soap box orators and misguided philanthropists. A similar plan was installed by the company eight years ago, but was unsuccessful. The company's second endeavor was begun only after a considerable amount of educational work. Mr. Phillips warned manufacturers against inaugurating any such plan overnight. He said they must first take time to teach the men the problems of the business. One of the first steps taken by the American Multigraph Co. in educational work was in forming a class of 61 men from the shops, who took a course in efficiency. The company paid two-thirds of the cost and the men one-third, but the promise was made that to those men who completed the course successfully the one-third would be rebated. Every man of the 61 went through the course and got a good record, whereupon the company paid the entire cost itself. Other instruction is being given in shop practice, shop mathematics and other similar subjects. The company now has a class of 250, who by their own volition are profiting by the instructions offered. One conclusion that the company has reached through closer contact with its men is that they are as a rule conservative and constructive in their ideas and many of them have more brains than they are generally credited with by their employers.

Opposed to Wage Reduction

F. Fosdick, president Fitchburg Steam Engine Co., Fitchburg, Mass., stated that manufacturers do not want to see wages reduced provided they can manufacture at a profit and meet competition. He said that welfare work has in many instances proved a failure because it has been performed more for the employer's benefit than for the employee. The industrial tendency of the times, he said, is to think more of the other fellow. The curse of Government and the curse of industry, he added, is selfishness, and hitherto business has not been conducted unselfishly by either employer or employee.

Frank Burgess, Boston Gear Works, Norfolk Downs, Mass., said that in a small plant employing from 100 to 300 men he had found it impracticable to conduct educational work. His suggestion was that manufacturers in this position co-operate with the Y. M. C. A.

The objection of Mr. Phillips of the American Multigraph Co. to outside education was that the company employing this method would lose the benefit of close personal touch with its men.

President O'Leary made a number of comments, one of which was that employees are not awake to the economic principles of industry.

At this point, H. D. Wilson of the Wilson-Snyder Mfg. Co., Pittsburgh, asked the advice of the association on the question of whether the metalworking shops of the Pittsburgh district should operate on a 48-hr. or a 54-hr. week basis. He said that the two largest employers in the Pittsburgh district, the United States Steel Corporation and the Westinghouse companies, have adopted the basic 48-hr. week. The majority of the other metalworking shops of the Pittsburgh district during the war followed suit in order to retain their workers, but at the present time the Pittsburgh employers, outside of the two interests above mentioned, are inclined to return to a 54-hr. week. After a long discussion, the sentiment of the association was summarized by President O'Leary that the question of hours is a matter for local determination. He thought it undesirable to suggest a uniform working day as conditions differ in different districts and in different industries.

Awaiting Peace Settlement

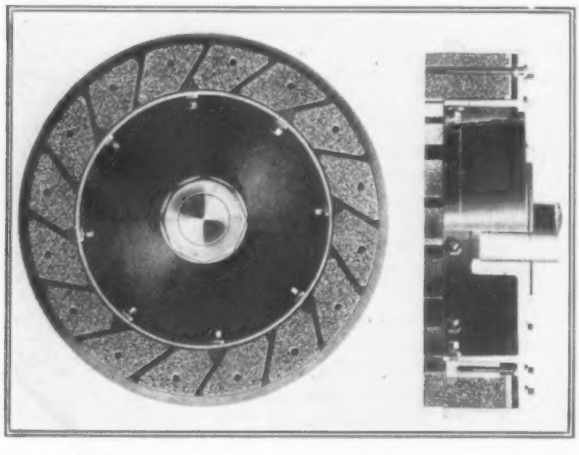
William H. Barr, Buffalo, president National Founders' Association, said that he was not in favor of a reduction of working hours at this time, adding that it would be foolhardy to reduce the standard working day until American manufacturers know something of the status of labor here and abroad to be fixed by the peace settlement. Mr. Barr said that the 8-hr. day had not proved successful during the war, and he doubted whether it would be successful in a time of peace. He said that manufacturers must cease talking about their rights and talk about their duties. Under present conditions, he believed that it would be unfair to the workmen to cut down their working time. Statistics of the National Metal Trades Association showed that finished production per capita during the last four years has shown a continual decline, and this situation, if it becomes much worse, would be a great handicap to American industry in meeting international competition. Mr. Barr said that this country is beginning to feel strong competition from Japan in metalworking lines. He cited a $500,000 order for electrical machinery which went to Japan in competition with leading American builders.

Herbert H. Rice, General Motors Corporation, Detroit, who was a member of the War Labor Board, said that it was not true that the board favored an 8-hr. day. He said that the labor members of the board would not keep their agreement on the question of the working day but injected arguments in favor of an 8-hr. day at every opportunity. Mr. Rice said that half of the decisions granting an 8-hr. day were made because the plants affected were already working three 8-hr. shifts. "I know of plants," said Mr. Rice, "where the unit cost is lower on an 8-hr. basis than on a 9-hr. basis, but that does not prove that the 8-hr. day is best for everybody."

Magnus W. Alexander, General Electric Co., Boston, was asked to state whether the National Industrial Conference Board, of which he is a member, had discovered any data which would determine how the length of the working day affects the health of workers. Mr. Alexander said that there is no comprehensive, realiable information on this subject, although a number of investigations had been made. The information compiled in Great Britain, he said, was during a time of war and could not be accepted as a basis for normal peacetime conditions. Mr. Alexander advised manufacturers to pay more attention to improved methods and selection of employees. He said the first point is not whether the working day shall be eight or nine or ten hours, but the quantity of production per capita that is gotten from the men. He said that manufacturers should bend their endeavors to get out the maximum production per capita with due regard to the health of the workers.

Automatic Knife and Edge Grinder

An automatic knife and edge grinder with a heavy cabinet base and sectional wheel has been placed on the market by the Bridgeport Safety Emery Wheel Co., Inc., Bridgeport, Conn. The bed of the machine has wide flat tracks, the carriage is heavy and has a finished top with three T slots, the outer edges being yoked under the bed to hold it securely in alignment



Radial Partitions Divide the Chuck Into a Series of Pockets for Wheel Sections. The sections are set forward as materially worn away

and gibbed to take up for wear. A stiff heavy knife bar with a journal at each end and suitable blockings with bearings is bolted to the carriage with worm and worm gear to revolve the bar to any angle to get the desired bevel on the knife. The bar and blockings can be removed when the machine becomes an edge and surface grinder.

A feature of the machine is a sectional wheel chuck. This chuck has an inside ring cast with and forming part of the chuck, and has radial partitions which divide it into a series of pockets for receiving wheel sections. The radial partitions are made of such thickness as will give the desired space between each grinding section for clearance of the material ground off. The sections are set forward as worn away by a screw anchored in the back end of the chuck. There is a wedge between every two sections actuated by a screw acting equally to crowd each section against the divisional wall and outside rim of the chuck. The sections are of such shape that they have a shearing grind on the work. The chuck being cast in one piece, it is claimed, makes it free from tremble or vibration.

The grinding chuck spindle runs in ball bearings and the chuck and spindle are mounted on a pivoted head that swivels to grind work flat or slightly concave. The head is attached to a carriage which is fed up to the work by a screw operated by hand or automatically. The whole rests on a heavy back extension bed with a closed bottom forming a water reservoir to which a centrifugal pump is attached suitably piped to carry water to the work.

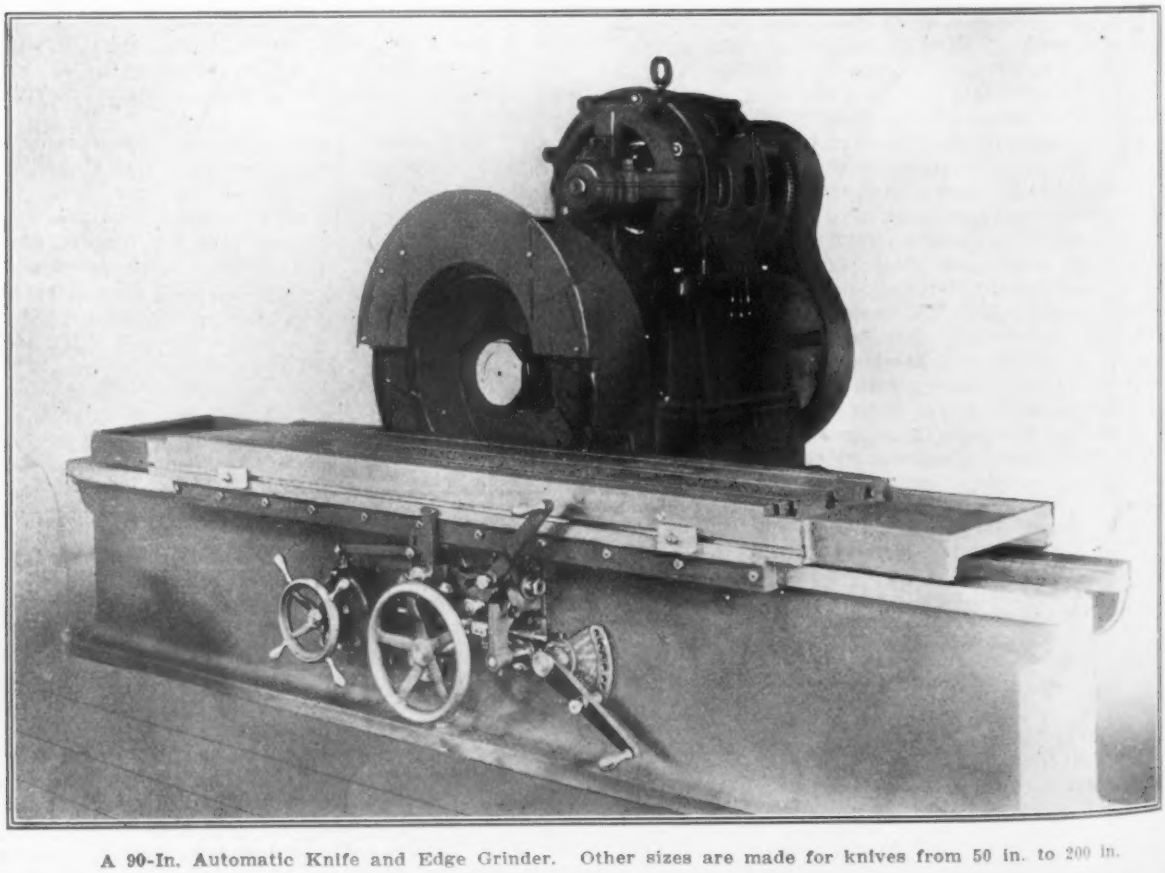
The machines are made in sizes to accommodate knives from 50 in. to 200 in.

Fellows Gear Shaper Co. Enlarges Plant

Owing to increasing business, the Fellows Gear Shaper Co., Springfield, Vt., has found it necessary to make further extensions to its plant, which was considerably enlarged during 1918. The extension planned will consist of a shop of steel and brick, two stories, 144 x 147 ft., and will increase the manufacturing capacity about 60 per cent. The company now employs approximately 450 men, and when the additional plant is in full operation the force will be increased to approximately 750, thus making this company, it is stated, the largest producer of gear-cutting machinery in the world.

In addition to the extension to the shop, a new office of steel and brick will be built, 42 x 102 ft. This office will face toward the river and will be entered by the new bridge constructed last summer. The entire top floor of the new office building will be occupied by the engineering and drafting departments, whereas the general offices will be located on the second floor.

The contract for this extension has been let to the New England Structural Co., Boston, and it is estimated that it will cost between $200,000 and $250,000, not including equipment.



A 90-In. Automatic Knife and Edge Grinder. Other sizes are made for knives from 50 in. to 200 in.

BUYING BONDS FREELY

Victory Liberty Loan Makes Progress Rapidly in Industrial Centers

Reports received by THE IRON AGE from leading industrial centers indicate that the response to the Victory Liberty Loan is more liberal than that to any of the other war loans.

About two-thirds of Cincinnati's quota of $30,000,000 was subscribed the first week of the campaign. From present indications the loan will be largely oversubscribed. In spite of the fact that the machine tool industry is going through a dull period, subscriptions by both the large and small concerns are in many cases larger than during the previous Liberty Loan campaigns.

Progressing at Chicago

The iron and steel and machinery committees in charge of the Victory Loan campaign in their respective fields in Chicago report rapid progress in rounding up subscriptions. S. J. Llewellyn, president of the Interstate Iron & Steel Co., is chairman of the iron and steel committee, as he was in previous campaigns.

E. P. Welles, president C. H. Besly & Co., Chicago, who has been chairman of the machinery committee in prior campaigns, is again in charge of that committee for the Victory Loan. He has 30 workers directly under him, each of whom is responsible for four additional solicitors, making 150 in all engaged in the work. To launch the campaign Mr. Welles called a meeting of workers at the Machinery Club on April 18, at which there was a 100 per cent attendance. The committee's program for this week included a meeting of 8000 men at the Deering plant of the International Harvester Co. on Monday, and a similar gathering at the works of the Western Electric Co. on Wednesday. The plans for these meetings provided not only for speakers but for entertainment by the Association of Commerce glee club and maneuvers by airplanes and tanks.

The vice-chairman of the subdivisions of the iron and steel committee, Chicago, other than the two previously mentioned, are as follows: Blast furnaces, Seymour Wheeler, Pickands, Brown & Co.; warehouse steel, Charles Heggie, Scully Steel Co.; steel works, C. F. Biggert, Wisconsin Steel Co.; fabricated steel, Paul Willis, Kenwood Bridge Co.; miscellaneous iron and steel, J. T. Llewellyn; tools, etc., J. L. Hench, Lackawanna Steel Co.; United States Steel Corporation, W. J. Totten, Illinois Steel Co.

Milwaukee Moves Rapidly

At Milwaukee more than 50 per cent of the apportionment of the Victory Liberty Loan allotted to Milwaukee city and county was subscribed during the first six days of the campaign. The quota is approximately $25,000,000, and actual subscriptions made public up to Monday morning amounted to $13,775,000. Among the largest subscribers in the iron, steel and machinery industry of Milwaukee are: Allis-Chalmers Mfg. Co., $1,110,000; the Falk Co., $500,000; Vilter Mfg. Co., $100,000; Harley-Davidson Motor Co., $100,000; Filer & Stowell Co., $100,000.

Edward J. Kearney, secretary-treasurer Kearney & Trecker Co., milling machines, Milwaukee, is serving as director of the campaign in the State of Wisconsin, a position which he filled during the Second, Third and Fourth Liberty loans.

For the fifth successive time Detroit was the first major city in the United States to oversubscribe its quota in the Government Loan campaign. In the Victory Loan drive it took the city just 24 hours to go $8,000,000 over its quota of $55,494,413, while the state was over the line the second day. By the end of the week Detroit's subscriptions had passed the $80,000,000 mark, insuring an oversubscription of at least 75 per cent before the campaign is concluded. The Peoples State Bank of Detroit led the Michigan subscriptions with $20,000,000, while the Henry Ford interests led the industrial concerns with a total of $10,000,000 as a guaranteed minimum. This is divided as follows: $5,000,000 Ford Motor Co., $3,000,000 to Ford employees, and $2,000,000, Henry Ford & Son and its employees. The next largest industrial subscription was from Dodge Bros., $2,500,000, followed by the Great Lakes Engineering Works, $1,400,000; Packard Motor Car Co., $1,000,000; Dodge Bros. employees, $1,000,000; Hudson Motor Car Co. and employees, $600,000.

Many Employees Subscribe

Subscriptions to the Victory Loan approximated $5,000,000 at the end of the first week in Mahoning County, Ohio, whose quota is $8,817,050. The bulk of the purchases is by iron and steel companies and their employees, who have taken $3,500,000. James Howard, a watchman at the Ohio works of the Carnegie Steel Co., bought $4,000 worth of bonds. At Carnegie plants 5779 workers took $796,500 of bonds, for an average of $138. Republic Iron & Steel Co. employees to the number of 3190 purchased $470,400 in bonds. Brier Hill Steel workers took $250,000; Truscon Steel Co. employees, $70,000; furnace plant, Sharon Steel Hoop Co., $25,000; Youngstown Pressed Steel Co., $25,000; Struthers Furnace Co., $23,250; Girard plant of A. M. Byers Co., $55,000; W. B. Pollock Co., $25,000.

With a total quota of $81,500,000, Cleveland subscribed about $18,000,000 to the Victory Loan during the first week of the campaign. This amount compares very favorably with the first week's subscriptions during the previous campaign, and Cleveland expects to exceed her quota as she did in the former loans. Few of the largest bond buyers have as yet subscribed, deferring the placing of their subscriptions to later in the campaign. Among the largest subscriptions so far reported are the following. Bourne-Fuller Co. and Upson Nut Co., $500,000; McMyler-Interstate Co., $250,000; Chandler Motor Car Co., $250,000; American Shipbuilding Co., $200,000; Oglebay, Norton & Co., $100,000; National Malleable Castings Co., $100,000.

Birmingham, Ala., raised $1,000,000 a day in the Victory Loan drive and by Saturday had gone far beyond 50 per cent of the allotment of $6,911,650. As usual, the iron, steel and coal interests were to the fore, although the largest concerns had not announced their quotas. The loan progressed with greater ease and dispatch than any of its predecessors.

Victory Loan Notes

Men and women employees of the Westinghouse Air Brake Co., Wildering, Pa., and its subsidiary, the Union Switch & Signal Co., Swissvale, Pa., have pledged themselves to sell $604,100 of bonds to fellow employees. The campaign started on Monday, April 28, and is expected to be finished in three days.

The West Penn Steel Co., whose plant is at Brackenridge, Pa., about 30 miles from Pittsburgh, claims the distinction of being the first of the steel companies to "go over the top" in the Victory Loan campaign. This concern reports that out of about 1100 employees every one subscribed for a Victory Bond, the total subscription having been $233,500, or an average of about $207 for each employee.

When 33 1/3 per cent of the time alloted to the Victory Loan campaign had expired, only 18.65 per cent of the required $4,500,000,000 had been subscribed, or $839,479,900. This indicates that but little over half of the computed amount for the first week had been raised and forecasts a spurt in the final days.

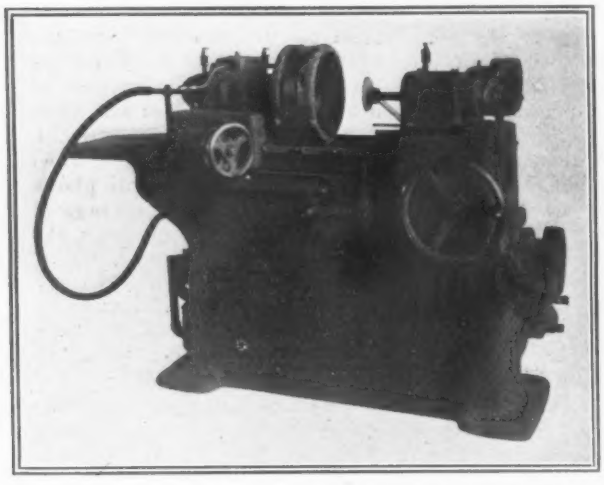
The following are the amounts subscribed in New York by some of the industries: Republic Iron & Steel Co., $1,000,000; the United Shoe Machinery Co., $1,000,000; Remington Typewriter Co., $500,000; J. L. Mott Iron Works, $50,000; Worthington Pump and Machinery Corporation, $175,000.

The first trade in Brooklyn to reach the $1,000,000 mark was the Machine and Machine Tools Division, headed by H. H. Doehler of the H. H. Doehler Die Casting Co. Of this amount $500,000 was subscribed by E. W. Bliss and $265,000 was taken by A. Schrader Sons, Inc. The Yale & Towne Mfg. Co. announced an extra dividend of 5 per cent to aid stockholders buy notes.

Charles M. Schwab originated the following slogan: "The four Liberty Loans put the punch into victory. The Victory Liberty Loan will put the punch into prosperity."

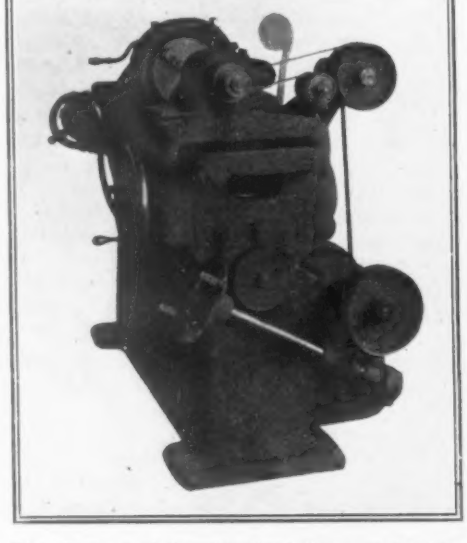
Bore Grinding Machine

The bore grinding machine illustrated is the latest product of the Taylor & Fenn Co., Hartford, Conn. The machine is self-contained and may be driven from a line shaft, or an intermediate jack shaft may be used if desired. The cross feed, instead of being placed under the wheelhead, is placed under the workhead. An unusual construction is had in that both the cross and longitudinal movements are on V and Flat-ways, thus doing away with all gibs.



This Machine Will Grind 8-In. Holes, 8 In. Deep, and Larger Holes in Case of Emergency. There are four work speeds and three table speeds arranged in geometrical progression; spindle speeds range from 6000 to 25,000 r.p.m. The diameter of the inside of the chuck guard is 12 in.; swing of machine without chuck guard, 14 in.; travel of automatic cross feed, 3 in.; floor space, 42 by 95 in.

The handwheel for controlling the cross feed is mounted at an angle so as to be convenient for the operator when leaning over watching the work. The pawl lever for the cross feed is operated at both ends of the longitudinal stroke and receives its motion through the swinging leaf just below the table. This swinging leaf is operated from the trip lever for the longitudinal feed, thus making it possible to operate the cross feed and table reverse with one set of dogs, these being visible on the front of the table to which they are fastened by bolts in a T slot running along the front edge. The stroke of the pawl lever for the cross feed is controlled by an adjustable nut and screw mechanism back of the handwheel.



The Cross and Longitudinal Movements Are on V and Flat-Ways, Thus Doing Away with Gibs

Longitudinal feeds are obtained through a rack and pinion mechanism driven from the gear box placed on the back of the machine. This gear box gives three feeds, these being changed or controlled by the short lever at the left of the sector at the right end of the machine. All gear boxes are mounted on the outside of the frame, thus to avoid cutting holes through the base in order to install the parts on the inside. This construction, it is claimed, makes the machine more rigid.

The work spindle is started or stopped by a brake operated by a lever projecting from the front upper part of the workhead. The spindle is of large size and runs in tapered bronze bushings provided with means for taking up wear. The oiling is by sight feed lubricators. All shaft holes coming through to the outside of the machine are plugged in order to prevent dirt getting into the bearings. The table is cupped down over the bed to prevent dirt from getting on the ways.

The complete wheel spindle unit is carried on top of the bridge, which is heavily ribbed and bolted to the bed for solidity. The spindle is driven by an endless belt from the main shaft through a jackshaft located at the back of the head. There are four work spindle speeds controlled by a long lever on the right of the sector located at the front right corner of the machine. The gears for these changes are also located in the gear box at the rear. All gears in this box as well as the reverse gear box are lubricated by a bath of oil, and all horizontal shafts connecting these boxes are inclosed in tubing to prevent dirt getting into the bearings. The drum providing for longitudinal motion of the workhead is mounted at the back of the machine obviating the use of a countershaft. All gear boxes, being placed at the back, do not interfere with the operator.

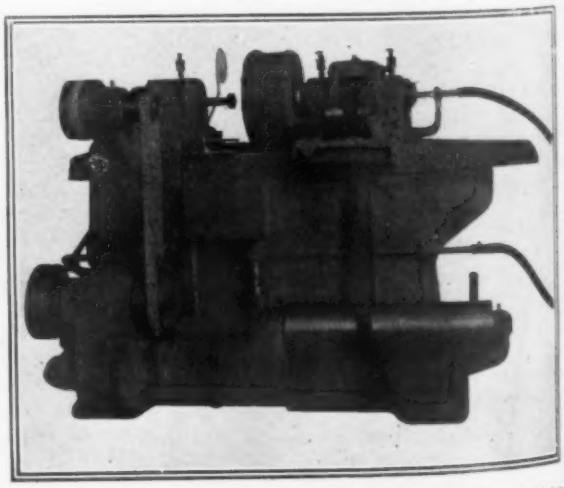
High-speed shafts turn in ball bearings, while the slow-speed bearings are of bronze. The wheel guard is automatically controlled and may be set from the front of the machine. Hand movement of the table is by a large wheel which is automatically disengaged when power feed is being used. The machine shown is for belt drive, but a motor-drive machine can be furnished if desired, in this case the main drive pulley being replaced by a coupling which connects directly to the motor that is mounted on an auxiliary base.

The water pump is inside of the base of the machine and is of the centrifugal type. A novel feature is the top of the table, which acts as a sediment pan. This is cast with a number of baffle walls and the water or cutting lubricant must travel twice the length of the table before returning to the tank in the base.

Motion Pictures for Safety Work

The use of moving pictures in safety work has recently been adopted by the Ford Motor Co., Detroit. A motion picture theater has been equipped at the plant, and for 45 min. at the end of the day shift each day a series of pictures is shown under the direction of the safety department. The pictures shown are those taken throughout the plant and illustrate safe and unsafe ways for operating machines and include other views that tend to educate the men to safe methods.

The presentation of the pictures is accompanied by talks by the safety director and by the foreman of the department that is attending the exhibit that day. New pictures are constantly being added and with the change of the shifts all employees have an opportunity to view them. New employees in particular are urged to attend. The shop men show a great deal of interest, and there is a daily attendance of about four hundred.



Longitudinal Feeds Are Obtained Through a Rack and Pinion Mechanism Driven from the Gear Box

Fresh Impetus to Foreign Trade Movement

Sixth Annual Convention of the National Foreign Trade Council at Chicago Was the Largest—Proceedings to Constitute a Textbook on International Commerce

The Government should immediately remove all restrictions now placed on American shipbuilding and permit the free construction of vessels for sale to foreign interests.

Government ownership and reasonable Government control of American shipping must continue until some acceptable plan is devised for the transfer of such tonnage to private ownership, but Government operation should cease, and, consistent with recognized war emergency needs, Government owned vessels should be allocated to suitable trades and trading routes for operation by any qualified competent American shipping enterprise.

Congressional consideration should be given to suitable plans for developing aerial navigation.

Among measures which should be adopted in furtherance of foreign trade are the establishment of free zones at the principal American ports, the enactment of a bargaining tariff law, and the improvement of the consular service.

The foregoing are some of the more conspicuous policies favored in the report of the general convention committee of the National Foreign Trade Council, the sixth annual convention of which was held in Chicago April 24 to 26. A thought current throughout the convention, and one set forth in no uncertain terms, was that Government control of railroads, wires and steamships should be abandoned at the earliest possible moment; another was that the excessive cost of wartime-built ships should be written off against the war.

Over 2000 Persons in Attendance

The convention was officially declared the most successful gathering of the kind ever held, as to attendance, elucidation and discussion of the questions at issue, and earnest and sustained interest in them. No fewer than 2000 delegates were present. Every branch of industry and commerce was represented, as was the United States Government and other countries, particularly France, Great Britain, China and Japan. At the various sessions nearly fifty papers on exporting and foreign trade were presented in aspects so many and varied that the convention report will comprise a textbook on foreign trade. San Francisco was selected as the place of meeting in 1920.

A year ago the convention, held in Cincinnati, was enveloped in a war atmosphere. This year, reference to the war, to the sacrifices that have been made and to the almost staggering problems which come as an inevitable aftermath were many, but where means of prosecuting the war were paramount at Cincinnati, there existed this year the less crucial task of stabilizing the economic situation and charting a course that will give American manufacturers their place in the markets of the world. Most of the thought as to market possibilities was projected in the direction of Central and South America. War-torn Europe has drawn too heavily on its resources to be a liberal buyer, a condition which will obtain until it has had opportunity to recuperate. The European nations will buy, but principally necessities, in the view of foreign visitors, and of these to the minimum extent.

The convention was called to order by James A. Farrell, president United States Steel Corporation, chief executive of the council since its inception. Alba B. Johnson, president Baldwin Locomotive Works, was made convention president, a post he has held each year since 1914, except last year, when the office was held by E. A. S. Clarke, now abroad. The general sessions were held in Orchestra Hall and the group sessions in the Congress Hotel.

Committee Report Crystallizes Convention Views

True to its custom, the convention passed no resolutions, but at its final session it adopted as a consensus of its views a report submitted by a general convention committee. This report sums up the conclusions that were considered fairly representative of the labors of the convention. It follows:

The Sixth National Foreign Trade Convention was assembled to consider and endeavor to solve the problems that now confront American overseas commerce as a result of the world war. Consisting of 2000 delegates, representing every part of the country and every phase of productive, commercial and financial enterprise, its voice is the authoritative expression of American foreign trade.

The war has wrought tremendous changes, not only among the belligerent nations, but among the non-combatants as well. One of its results stands out as certain to produce a marked effect upon the course of American foreign trade. The United States has become a creditor instead of a debtor nation.

Fairness to Debtor Nations

Nations which are our debtors, confronted with economic problems, will endeavor to curtail their purchases of finished products from us and to enlarge their sales to us. They must meet their obligations by finding a market for their products. At the same time their competition with us in neutral markets naturally will be extended.

The restrictions now imposed on American imports into the markets of our European associates in the war seriously impede the free flow of our commerce; but in so far as they are the outgrowth of a policy of safeguarding home industry and conservation of financial resources depleted by the heavy load of war liabilities, adverse criticism would seem unwarranted so long as such restrictions are not discriminatory.

These conditions and the keener competition in other markets must stimulate American enterprise to new activity and determination to find compensating outlets.

Need of Expanded Export Trade

This convention has presented clearly our national need for expanded export trade to meet new conditions abroad and to assist in stabilizing the industrial conditions at home. It has given emphasis especially to the vital interest of labor and of agriculture in the maintenance of our expanded foreign trade. Our educators are actively improving the methods and scope of

instruction in the technique of foreign trade. Our banking institutions are expanding their service to overseas commerce, establishing branches abroad, increasing the use of acceptances, facilitating foreign investment, and the financing of foreign trade. It is hoped that when the present exigencies of war financing have passed the Federal Reserve Board will give consideration to the desirability of readjusting rediscount rates for the benefit of American exporters. Our credit organizations are improving the service of credit information to facilitate the extension of adequate credit to foreign buyers. Numerous associations are forming to avail themselves of the benefits of the right to combine for export trade afforded by the new Webb-Pomerene law.

Urges Removal of Shipbuilding Restrictions

But certain vital factors are still lacking from the equipment of American overseas commerce to meet the competition of other nations on a basis of equality.

We urge the earliest possible completion of the Government's present shipbuilding program. As shipbuilding is one of the greatest essentials for the prosperity of American industry, the Government should immediately remove all restrictions now placed on American shipbuilding and permit the free construction of vessels for sale to foreign interests.

The imperatively necessary revision of our shipping, navigation, classification and measurement laws should be accomplished without delay so that American vessels can be placed on a more equitable basis of competitive operating costs in foreign trade.

While Government ownership and reasonable Government control of American shipping must continue until some acceptable plan is devised for the transfer of such tonnage to private ownership, we are opposed to any continuance of Government operation and urge that consistent with recognized war emergency needs these Government owned vessels be allocated to suitable trades and trading routes for operation by any qualified competent American shipping enterprise, under conditions of sale or charter that will permit of their sending the American flag to any port of the world on a fair trading competitive basis with that of any other maritime nation.

We also urge the immediate consideration of the necessity for establishing coal and fuel oil depots on all the great foreign trading routes so that American shipping shall not be left dependent upon foreign owned facilities for such vital service.

American-built ships for American foreign trade, freed from all burdensome restrictions, a fair world field and no favors other than those known to be absolutely essential to the reconstruction and highest possible development of our American mercantile marine —is the crying need of the day, if the United States is ever to win its rightful place in international commerce.

Crippled Cable Facilities

The world trade for which we are prepared with our increased productive capacity and for which we are preparing with our new merchant marine, can be handled only if we have adequate American facilities for telegraphic communication to all foreign countries. Competition with foreign producers requires equally rapid cable and wireless facilities as they possess. This should be a national trade policy, first carried into effect to those places where present service has proved utterly inadequate, as in the case of the single cable that forms the only direct connection between the United States and the Orient. Under the volume of direct business that is now developing this cable for several months has been many days behind in the transmission of messages, being more than eight days late at the present time.

Aerial Navigation and Foreign Trade

Realizing the unquestioned advantages of having the speediest possible mail and express service in enabling American enterprise to compete successfully in securing the specifications and requirements of our foreign contracts, this convention urges Congressional consideration of suitable plans for developing aerial navigation. The establishment of the necessary aids to such navigation, the investigation and development of the fundamental principles of commercial aeronautics, the promotion of airship service to overseas countries are matters which demand the present establishment of a separate department of the Government. One of its chief duties should be to provide the necessary information which will make possible the use of aerial navigation as an aid to foreign trade. Until the necessary legislation can be passed, it is our belief that the Department of Commerce should make every effort to promote in all possible ways the progress of aerial aids to both foreign and domestic markets.

The convention suggests to local chambers of commerce the advisability of having public airdromes in all centers that expect to develop large foreign markets in order that prompt delivery of plans and specifications, blueprints and invoices may be made from seaports to the interior. Until such airdromes are built local manufacturers will be under the disadvantage of being denied the privilege of speedy receipt of desired documents from great centers of distribution.

Free Zones and Bargaining Tariff

The establishment of free zones at the principal American ports where products from all countries can be assembled, classified, manufactured and reshipped, will be of great assistance in developing full cargoes both ways so essential to the success of the new American merchant marine.

The convention records its satisfaction at the action of the United States Tariff Commission in recommending to Congress the enactment of a bargaining tariff, a measure which has been consistently advocated by every National Foreign Trade Convention. Desirable as such a measure was before the war, it has now become essential to our commercial development. Our new and influential position in foreign commerce and finance makes imperative a bargaining tariff for the protection of American commercial interests in foreign countries.

The enactment of a bargaining tariff need not wait the general revision of the tariff law. The protection of our commercial interests requires prompter action. Such a measure involves neither the policy of free trade nor the policy of protection. Upon it all shades of tariff opinion may unite. It is an essential part of an economically sound foreign trade policy.

Congress should immediately undertake the consideration of the many pressing problems of reconstruction upon the solution of which depends the future of American foreign trade.

The necessity for the extension of international parcel post is emphasized by the fact that the United States at present enjoys such communication with but approximately one-half as many countries as have such communication with Great Britain. The recent activity of the Postoffice Department in seeking to extend these facilities for the United States is highly commendable.

American foreign trade enterprise is entitled to every facility that government legitimately can give in the fulfillment of its proper functions. The Government should be liberally equipped in all its departments to render the fullest service. The State Department should have adequate and competent representation in all lands, and especially in those new nations sprung from the reorganization following the war. Its representatives should be fully compensated and properly housed, and supplied with all the means for effective service.

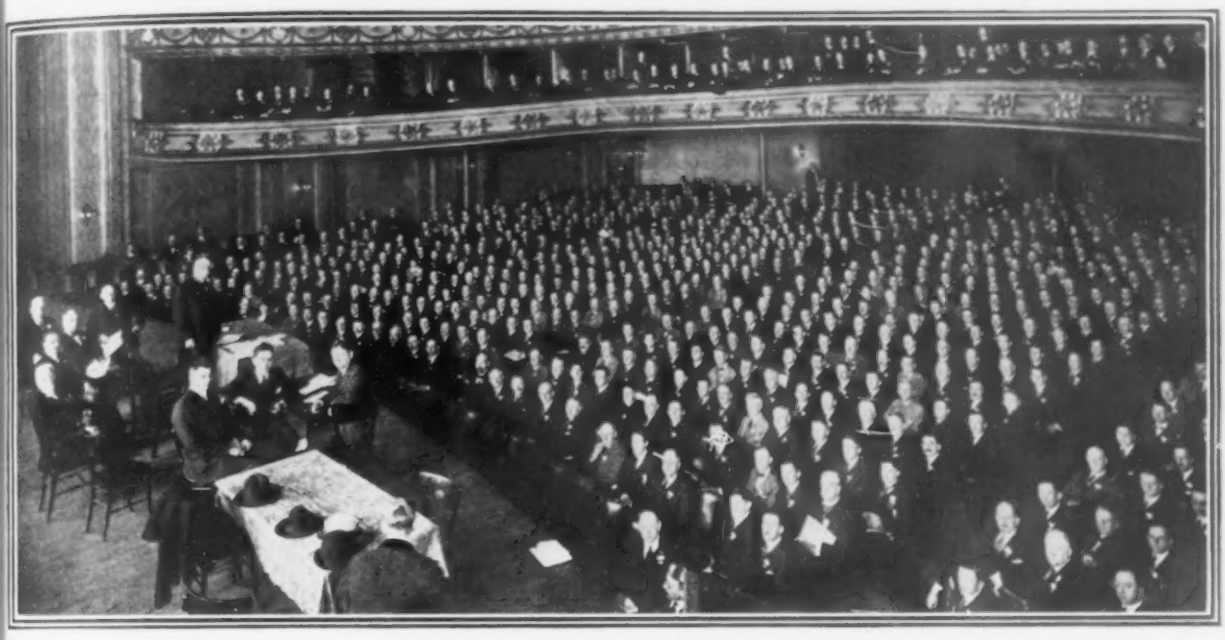
Should Extend Consular Service

The consular service through the last appropriation bill is now made wholly American by being relieved of the necessity of employing foreigners as consular agents. This is a much-needed step in the right direction and it is hoped that it will be followed by legislation establishing both the diplomatic and the consular services on a basis which will attract competent and ambitious young men into our foreign service as a permanent career.

The commercial attaché and trade adviser service of the Bureau of Foreign and Domestic Commerce

should be materially expanded and placed upon a permanent basis with an adequate scale of compensation. The system of constant shifting of attachés from one country to another now made necessary by insufficient appropriations results inevitably in great and needless waste of the information gained by experience. This service should be expanded so as to have at least two attaches for each field, thus enabling the bureau to have one expert always in the field, and another similarly trained always available for consultation with manufacturers and business men in the United States.

The position of the United States as a creditor nation tends to stimulate American investment in foreign countries. Legitimate American investment abroad is entitled to the same measure of governmental protection in the countries where made that is given by this government to foreign investments in the United States. The situation resulting from changes of government in other lands demands the enunciation and enforcement by the United States of a policy of firm support of all legitimate American enterprise and investment abroad.



Opening Session of the Convention, Alba B. Johnson Presiding. The platform group includes James A. Farrell, chairman National Foreign Trade Council

By occasional exchange of their foreign and domestic posts these men would be kept familiar with conditions in their field and equipped to render valuable service to the business interests of the country.

The action of Congress in limiting the appropriation for the bureau, which will cause the curtailment of the service of its domestic branch offices, should be immediately corrected by Congress.

The principle of export railroad freight rates to our seaboards lower than domestic rates, as a proper means for the encouragement of foreign trade, has been recognized for many years, until the necessity of curtailment of exports of articles required for the prosecution of the war impelled the withdrawal of the export differential. The convention recommends the general reinstatement of the export differential.

Foreign Trade Policies of the After-War Period

Mr. Farrell, in calling the convention to order at the opening session, said in part:

The war has produced conditions which cannot yet be fully assessed. Out of these conditions are arising problems of overwhelming concern to us all, some of which as yet stand out vaguely and in dim outline.

The years of the war have wrought tremendous changes, not only in Europe among the embattled nations, but among the neutrals and noncombatants as well. The United States has become a creditor instead of a debtor nation. It is reasonable to expect that the nations which are our debtors will seek to curtail their purchases of finished products from us and to enlarge their sales to us. Such procedure is but a part of the natural policy of self defense, and recuperation from the financial debauch of four years of war expenditure without compensation of profitable exchange in the commerce of peace. It is incumbent upon us to turn our efforts and our energy to the development of new markets and the discovery of new opportunities in old markets. And we must not forget that foreign trade is not one-sided. Every transaction involves a foreigner as well as an American and is best when it prospers both. Nor must we overlook the fact that the stream of foreign trade is made up of two currents, one outgoing and one incoming. Expansion of exports is not attainable without corresponding increase of our imports. The invisible balance that during the war was against us, and that offset the habitual excess of our exports of goods, has been transformed into a huge invisible balance in our favor, which we must now seek to offset by a visible balance of exports.

Keynote of Convention Topics

Mr. Johnson, on assuming his duties as convention president, called attention in a general way to matters that would engross the attention of the convention and to some extent sounded the keynote of the gathering in the following:

Perhaps the subject of most importance to the country at this time is that of our commercial marine. We must now determine what we shall do with these ships, whether we can adapt the great shipbuilding facilities which we have created to the peaceful development of our commerce, or whether we are to fall back to our old state of inferiority as compared with other nations successfully engaged in operating merchant shipping. We have established shipbuilding plants that are larger in productive capacity than those of any other nation. We built yards and ships without regard to cost and at a colossal expenditure of the people's money.

Whatever may have been their cost, however, we now possess the greatest shipbuilding plants in the world, and if we choose to do so, we can continue to produce ships faster than any other nation in the world. Our newly constructed tonnage is owned by the Government. There is no reason to believe that government ownership and operation of ships will be more successful than the costly experiment in government operation of railroads has been. Our adventures in government operation of railroads, telegraphs, telephones, etc., have emphasized the truth that was already perfectly well known, that no business operation can be conducted as efficiently and successfully by government as by private management. As yet there is no sign of a national policy nor the

beginning of a policy. We are still drifting. Our ships cost more to build than the ships of any other nation, and they will cost more to operate.

Mr. Hurley has proposed recommendations of much interest for the disposition of our ships to private owners, but no progress has as yet been made in solving the problem of operating our ships upon a competitive basis with other countries. They will have to accept rates established by the nations operating at the lowest costs, such as Japan, Norway, Italy and Spain. How is the gap between high costs and low receipts to be filled? If the American people are in earnest upon any subject, they intend never again to permit their flag to disappar from the seas, but they have discussed no plan to such a point as to indicate a probable agreement upon Mr. Hurley's admirable recommendation, nor upon any other.

We Must Sell—And Buy

For years we have dwelt upon the need for foreign trade to stabilize our fluctuating demand and production. Our resources are so varied, our supplies of raw materials so boundless, we have believed so fully in our ability to produce nearly everything that others produce, that we have given little thought to the necessity of reciprocally buying in other markets as a condition essential to the development of foreign trade. Fundamentally, trade is not confined alone to selling, it is the reciprocal exchange of commodities. When we have sold to a man all he has money with which to buy, he ceases to purchase until he can sell something with which to obtain money to resume buying. If he sells his goods to others, a third party divides the profits arising from the transaction. If he sells his goods directly to us, the third party is eliminated and the profits accrue only to the two parties to the trade. The money which might have enabled our principal buyers to continue buying, has, however, been spent for war materials and they have already borrowed more than they can afford.

Where, then, are they to find money to buy from us if we buy nothing from them? President McKinley endeavored to impress this truth upon the nation in the last great address which he delivered at the Buffalo Exposition, just before he was shot down by the assassin's bullet, yet we have continued to strive to expand our exports and diminish our imports. In this respect again the war has brought about new conditions in which we must give consideration to the needs of the buyer. Of what benefit to American commerce are lire in Genoa or pesetos in Spain if the rates of exchange for dollars in New York are so high as to forbid the purchase of American goods? The time has come for us to follow the example of England and Germany in studying the import problem and devoting our energies to bringing about a real interchange of foreign commodities for American exports. We must also broaden our views as to foreign investments, realizing that properly secured investments in stable foreign countries are quite as attractive as investments at home.

Government Protection Essential

This brings us to a subject of vital importance, viz. The need of an authoritative statement by our government that American investments abroad will receive equal protection as debts owing to the people of other countries. So long as American investors retain vivid recollections of comparatively recent events in Mexico and China, there will be continued reason for misgivings by American investors which will react unfavorably upon American foreign trade.

Every reduction in our national efficiency and every increase in the cost of production in the United States tends to limit our export trade. Wherever the Government attempts to perform services which could be performed by private enterprise, there results a decrease in efficiency and an increase in cost. Railroad transportation and wire communications are amongst the first essentials of foreign as well as domestic commerce. The extent that it increases cost and reduces efficiency, the government operation of railroads and the wires, constitutes a handicap to our foreign trade. Every exporter should therefore be keenly interested in the earliest possible solution of our problem of terminating government operation, which can only be done after the passage of the remedial legislation necessary to protect their owners against the disaster of operating under the unprofitable conditions which have been introduced by government control.

Discussions of Group and General Sessions

At each of four general sessions, except the last, which was largely devoted to reports and the closing work of the convention, four papers were presented, the general convention theme, as formerly, being "Foreign Trade Essential to American Industry." Sub-divisions of this subject were "America's Need of Foreign Trade" and "The American Merchant Marine." These papers, with those offered at the group sessions, compose a voluminous mass, and but bare mention can be made of addresses representing a wealth of thought, investigation and facts gleaned from experience.

Edward Prizer, president Vacuum Oil Co., emphasized the need of accurate knowledge of foreign markets, of exercising great care in selecting foreign representatives, of maximum support on the part of the National Government and intelligent control and operation of our shipping, in his paper on export of industrial products. He said: "We have embarked on a great national shipping adventure—and we are as yet mere novices at the game. It is not too strong a statement to make that our national prosperity in export commerce will depend upon the wise and intelligent operation of our merchant marine. All other things being equal, the nation that controls shipping controls export trade."

Financing Foreign Trade

Fred I. Kent, vice-president Bankers Trust Co., New York, after analyzing financial conditions at home and abroad, and their bearing on trade, in his paper on "America's Financial Equipment for Foreign Trade," summarized the world trade situation which will face the United States upon the conclusion of peace as follows:

We will be called upon by our Allies to supply them with the minimum amount of goods with which they can get along, whose maximum will undoubtedly be determined more by the amount of credit which this country can furnish to them through investments and otherwise than by the demands of such countries, for they can undoubtedly use effectively more of our raw material and manufactures than they can purchase without our help. Our Allies will owe us interest, which they can only pay in foreign exchange that they can accumulate on balance, except as the United States reinvests such payments in the countries which make them.

The neutral countries of Europe should import from us more than they export to us. Our trade with South America, while against this country, should not be so in such proportion as has been true in the past. The same condition will probably prevail in our commerce with the Far East.

In a paper on "The Element of Cost in American Exports," William Pigott, president Seattle Car & Foundry Co., made a plea for conservation in overhead expenditures, admitting that he invited the charge of being old-fashioned, and urging that time and money be not spent in trying to develop a foreign market for merchandise or commodities on which conditions make it impossible to compete with foreigners. Before advising some drastic cuts of expenditures and the elimination of waste, he said:

Americans seem to have lost all sense of values. We have drifted away from the basic principles and fundamentals of our business and social life, and unless we go back to plainer living and higher thinking we will not only demoralize everything in the way of our domestic, social and business affairs, but forever bar ourselves from enjoying the full benefits of foreign trade which our great abundance of raw material, up-to-date plants, and business efficiency entitle us to.

The overhead must be reduced and efficiency increased.

"The Bargaining Tariff" was the subject of William S. Culbertson, member United States Tariff Commission. After detailed treatment of his topic, including features of tariff laws long enacted, he concluded:

Not the least important measures, which our national interest calls for, is an adequate, flexible, effective bargaining tariff. If we are not in a position to enforce equality of treatment, we shall probably not get it. In fact, we are not getting it to-day in some important markets. Such a measure involves neither the policy of free trade nor the policy of protection. Upon it all shades of tariff opinion may unite. It is an essential part of an economically sound foreign trade

policy. Let us have pride in the resourcefulness and progress of our overseas trade and finance; let us look to the future with confidence; but let us not falter until our enthusiasm yields concrete results in legislation.

For American Representation Abroad

James W. Hook, president Allied Machinery Co. of America, in a paper entitled "The Stabilizing Effect on American Industry of a Definite Foreign Trade Policy," said:

I am a great believer in the theory that American goods should be sold abroad by Americans. I say this perhaps in a general sense, for it is well known to every one that native salesmen under American leadership are often necessary. But we should have the American leadership. We ought not to go back to pre-war days when the American producer handed over his foreign selling rights to foreigners, who in a great many cases, only tested the market with American goods and then made these goods as competitors.

We only have to go back to the beginning of the war in 1914 to see the dangers of this practice. Then, hundreds of manufacturers in the United States, who had depended wholly upon foreign agencies for their export business, suddenly found a large portion of their foreign selling organization destroyed. Then, and only then, did it dawn upon them how utterly dependent America was upon foreigners for much of her export trade. The situation might have proved disastrous to many had not the war assumed such proportions as to tax the producing capacity of the entire world. This great demand enabled manufacturers to make new connections with other selling agencies; but many were not serious in their intentions and are now rapidly going out of business.

Regardless of this experience, American capital and American manufacturers have not prepared for the present day conditions that the simplest foresight made apparent as the war progressed. I refer to the creation of American selling agencies abroad.

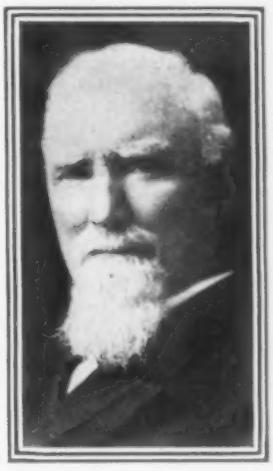
America must immediately enter upon the serious business of building a foreign selling organization. She must not operate through foreigners any longer. She must lay the foundation of complete independence from every nation in the world in all matters involving her export trade. She must deal with the problem in a specific and practical way. Producers who have products to sell abroad want to be specifically shown the step-by-step way of doing it. Talk of trade balances, exchange fluctuations, or the probable intrinsic value of a silver dollar five years hence, does not specifically interest them. Once a feasible and workable plan is devised—and many have been—they want it developed so they may take advantage of it.

Perhaps it will appear that all I have said is simply an introduction to a plea for support of the Webb law. This is hardly true. The greatest significance that I can place on the Webb law, is the fact that it shows that the American people have begun to awaken from the sound slumber that has engulfed them so long on the importance of our foreign trade.

Derides Fabricated Ship Method

At the session devoted to merchant marine, Homer L. Ferguson, president Newport News Shipbuilding & Drydock Co., deviated considerably from his prepared address. He predicted that of the 400,000 shipyard workers now in the United States there will remain about 100,000 when things become normal again. He said the fabricated ships built during the war had cost about twice as much as ships built "under the old-fashioned methods, in the old-fashioned yards," and that the latter were better ships. He stated that the cost-plus plan of shipbuilding would prove a deadening influence on the industry; made a plea for American standards in ship construction, and for American marine insurance to replace Lloyd's inspection and insurance. He placed but little confidence in large ships built of concrete, though concrete might be found adaptable for small vessels.

J. W. HOOK
President Allied Machinery Co. of America



ROBERT DOLLAR
President Robert Dollar Co.

E. P. PRATT
Vice-president Overseas Products Corporation

Mr. Ferguson was emphatic in his statement that the excessive cost of war-time built ships should be written off as a war cost, whether or not the vessels are retained by the Government. He poked some fun at newcomers in his field, remarking, after saying that ships must be tight as well as of the proper shape, that novices in shipbuilding had done better in creating shape than in tightening.

He said that where Government vessels have not been laid down they should not be built. He conceded that it was splendid to keep men employed, but with the war over they should not be employed at war wages. He told of negroes who were receiving from $100 to $175 a week in the yards—wages fixed by men who did not know what they were doing. He urged that the shipyards get back to a competitive basis, and that the element of chance, that oftentimes makes business attractive, be restored. Mr. Ferguson was accorded a demonstration by the delegates.

Mr. Ferguson also said:

Repetitive or manufacturing processes in a shipyard are exceedingly small and, except for his ancient aversion to labor saving tools, the European workman in a shipyard has had the reputation among shipbuilders of doing as much work as an American workman; their greater skill and experience in the minor trades offset to a large extent our use of more modern equipment. Except in the use of pneumatic tools, the British and German shipyards are not particularly different in their equipment from the American yards. It is likely that the experience of first class American manufacturers in shipbuilding during the war has at least convinced them that shipbuilding and manufacturing are different businesses.

American ship owners state that it is very difficult, if not impossible, for them to compete with foreign owners on account of high wages paid, and more men required. It is interesting in this connection to note that the wages of seamen constitute probably from 7 to 12 per cent of the cost of operation of a vessel, whereas in the building of a vessel in a shipyard from 40 to 50 per cent of the total is labor. We will more likely compete with foreign shipbuilders in the design and building of special vessels for a given service than in building what are known as "tramps."

Defends Fabricated Ships

In the absence of E. C. Bennett, vice-president and general manager Newburgh Shipyard Co., Newburgh,

N. Y., his paper, which proved a defense of the fabricated ship, was read by Secretary O. K. Davis. In part Mr. Bennett stated:

In connection with our vast shipbuilding program we find the term "fabricated ship" applied to vessels constructed of steel, which has been fabricated in the various structural and bridge building shops located principally in the middle west States. The extensive publicity given to the fabricated ship and the layman's ignorance of exactly what is meant has surrounded the term with such an air of mystery that the optimistic have regarded the fabricated ship as the savior of the shipbuilding program; while the pessimistic have blamed it for nearly everything that has gone wrong. There really is nothing mysterious in the term "fabricated ship" for the reason that all ships are fabricated and it makes little or no difference in the completed ship whether the material entering into its construction is fabricated in the shipyard or at a plant miles away from the place of construction.

When we look back over the extent of our shipbuilding facilities prior to 1917, we must acknowledge that the so-called "fabricated ship" was the only logical method by which an extensive shipbuilding program could quickly be undertaken. We had no Aladdin's lamp whereby a shipyard and its machinery, both mechanical and human, could be organized and constructed overnight, and with the great wartime demand for munitions and machinery, it was impossible to procure in anything like the necessary time the machinery required to handle the enormous shipbuilding program undertaken by this country. In furtherance of our war preparations, bridge building and other structural steel construction was greatly curtailed and it was only logical therefore that the extensive fabricating machinery of the various bridge shops should be called upon to contribute their share to our war activities.

Frederick J. Koster, president San Francisco Chamber of Commerce, urged the early return of shipping and the railroads to private control. Mr. Koster also had a good word to say for the Japanese and said that some day we would have to make the Japanese our partners in developing the Orient, and our attitude now should be one of generosity.

At the final session Capt. H. R. Moody, Q. M. C., U. S. A., read an interesting paper on "Packing for Export," with special reference to methods developed in shipping supplies to the Expeditionary Force in France.

Group Sessions Prove Valuable

Eight group sessions, each of which considered specified subjects at hours which did not conflict with the general meetings, were held during the convention and two to four formal papers were presented at each. President Johnson declared that much of the real work was done in the smaller meetings because in them experience in the subject under discussion was concentrated, and those whose interest was but casual were not in evidence.

Following are the subjects considered at the group meetings, with comment on them:

Commercial Education for Foreign Trade.—The consensus of opinion was that foreign trade is a profession which can be learned only by study and experience, and that a cultural background is essential to the permanent establishment of foreign trade relations. Vocational training may be divided into three main groups of studies, namely: elementary and advanced methods of procedure; history, geography and commercial practices in specified foreign markets, and language training for these markets. Over 200 attended.

Foreign Trade Merchandising.—The addresses and discussion brought out a note of warning against short cuts to success. American foreign trade merchandising will succeed, but it must render good performance to do so. The attendance was 530.

Advertising—Selling—Representation

Advertising for Foreign Trade.—At this meeting 268 delegates, including a number of women, were present, and there was keen and active interest. It was the general opinion that the American manufacturer can establish a demand for his product in foreign countries with the same assurance of success in advertising that can be attained in the home markets, and that American advertising agencies have become highly skilled in making surveys of foreign markets. It was brought out that a small manufacturer whose investment must necessarily be moderate can look for success under the right auspices, a point emphasized by W. G. Hildebrant, of the Gotham Advertising Agency, who cited instances.

Direct Selling and Representation.—Between 500 and 600 attended this session. Charles W. Beaver, of the Yale & Towne Mfg. Co., brought out the things necessary for the establishment of a direct sales force in Europe, England, France and Italy. Mr. Beaver made direct sales arrangements in France and England for his company. He advocated the branch house, and a thoroughly American sales organization, in certain lines. The dominant idea appeared to be that Americans desire to do business in an American way in European countries, and that this is feasible in some fields.

Export Combination Under the Webb Law.—The conclusion of the conference was that American commerce with foreign countries will receive decided benefit from the operation of the Webb law, if in its interpretation restrictions are not placed on certain privileges enjoyed by manufacturers, such as the importation of raw materials from other industries, and if the law is applied in a broad, constructive manner, and that a great deal of its value depends on the type of organizations which are formed under it to meet the competition of other countries. About 200 attended.

Ocean Service.—The sense of the meeting was in favor of prompt legislation to permit American ship owners to operate their ships in competition with the ship owners of all foreign nations. It was also the sense of the meeting that more American insurance companies should be organized; also that if free zones were established, great care should be taken in framing the necessary legislation creating such ports in order to fully protect the interests of our citizens. The attendance was 400.

Thoughtful Banquet Addresses

The banquet was attended by over 1000 persons. At one end of the banquet hall was a representation of the bow, bridge and wheelhouse of an ocean steamship, the forward deck serving as a stage for a patriotic demonstration by a group of young women, each representing one of the Allied nations.

John J. Arnold, vice-president First National Bank, Chicago, presided. Capt. Pierre Lantz, representing the director general of French service in the United States, made a plea for France, asking long-time credits. France is honest, but needs credit, he said. She will pay, but not promptly. Particularly she cannot buy, and at the same time sell nothing. He said the United States must continue to loan and must also buy foreign securities.

Mr. Hurley on the Trade Outlook

Edward N. Hurley, chairman United States Shipping Board, said in part:

We should not complain about Great Britain, France and Italy placing temporary restrictions on a number of commodities which they import. They are the best judges concerning what particular products they can do without during the present trying economic periods which they are going through.

There has been a general feeling that the time has come when some definite step should be taken by the Government to clarify the rights of business—to establish a definite code of business practices, not merely with respect to the relation between one business institution and another, but with respect to the relations among business, labor and the public.

We don't have to study the Clayton act or even the Federal Trade Commission act to determine what is a safe business policy. You can go back to 500 years B. C. and find a rule of business that will guide you through the legal mazes. The Chinese philosopher, as long ago as that said: "What you do like when done to yourself do not do to others." It should not be necessary for business to obtain legal advice on economic questions.

We don't want constant interference by the Government in business affairs, because if we are to have a safety valve on American initiative, who is to set the valve? Who is

going to say that your sons and my sons shall be limited in legitimate business initiative? One of the things the returning American soldiers will demand is that they shall have as good opportunities as we have had. We can't guarantee each man's success, but we can guarantee them equal opportunity in making their own way to success. We shouldn't limit them by marking off the point of success beyond which they shall not go. We should keep the way cleared so that they can go as far as their ability and energy will carry them.

Mr. Farrell on Shipping Policy

Mr. Farrell's address on American Maritime Policy reiterated the objection to Government ownership of merchant marine which was voiced by the council three years ago, and his references to the subject aroused applause. In part he said:

The temporary appearance, as a military necessity, of the Government of the United States as a shipbuilder and shipowner on a colossal scale, does not render it any less a fact that the future of the American merchant marine must depend on the attractions which it offers to the employment of private capital and the application of private enterprises. The steamship business is one requiring special and exceptional aptitudes. The men engaged in it have to match their wits against the keenest in the world; have to be prompt in decision, resourceful, expedient and expert in the calculation of probabilities. These are qualities which are not usually forthcoming when a government assumes the functions of private enterprise. They represent, in fact, aptitudes which government service seems to deaden, for the simple reason that they are foreign to the demands of official routine.

As a commercial proposition, government owned ships in foreign trade could only result in disorganization of existing trade routes in which government ships might engage, while bringing about a complete paralysis of individual effort to obtain for private American ships a larger share of American sea-borne commerce. Thus, in the event of government ownership and operation of merchant vessels becoming a settled policy, the problem of the future of American shipping would solve itself by the extinction of private endeavor.

The Foreign Trade Council has already placed on record its conviction that American shipyards after the war will be able to produce tonnage at rates and under conditions that will compare favorably with those obtaining in foreign maritime countries. There will be no return, for some time at least in any country, of so called pre-war prices of materials and labor. Shipbuilding materials and equipment are on a lower level in the United States, since the signing of the armistice than in any other producing country; ship plates and structural material having declined $12 per ton here with a corresponding reduction in collateral forms of iron and steel products. In England, ship plates are selling at $67 per ton, shipbuilding shapes at $66 per ton; whereas in the United States they are $53 and $49, respectively. Since early 1916, wages in the steel industry in the United States have increased 131 per cent; labor costs in Europe and the Far East are well below the parity of wages paid here and will probably remain so, but this is not the case with respect to present prices of materials entering into ship construction. Although some have claimed that efficiency was rapidly becoming a lost art due to the tension of war, there is a noticeable improvement of late in efficiency and output; and American workmen can be expected to realize, as well as capital, the possibilities of a merchant marine and that our commercial prestige is bound up with our national welfare.

Gov. Frank O. Lowden of Illinois also spoke.

Iron, Steel and Machinery Men Present

W. G. Abbot, Consolidated Steel Corporation, New York; Norman G. Aeby, Liberty Steel Products Co., New York; Carl Aichberger, Sandusky Foundry & Machine Co., Sandusky, Ohio; T. P. Alder, United States Steel Products Co., New York; W. L. Allen, Laclede Steel Co., St. Louis; Robert S. Alter, American Tool Works Co., Cincinnati; A. H. Ames, Ames Iron Works, New York; John J. Amory, Gas Engine & Power Co. and Chas. L. Seabury & Co., Consolidated, New York; C. K. Anderson, American Wire Fabrics Co. and American Mfg. Export Association, Chicago; W. P. Ayer, Walworth Mfg. Co., Boston.

Frank Baackes, American Steel & Wire Co., Chicago; G. L. Bayley, Federal Export Corporation, New York; C. W. Beaver, Yale & Towne Mfg. Co., New York; C. E. Bement, Novo Engine Co., Lansing, Mich.; H. R. Bettis, Illinois Tool Works, Chicago; G. H. Blakeley, Bethlehem Steel Co., Bethlehem, Pa.; J. H. Blanchard, John A. Roebling's Sons Co., Chicago; C. H. Breker, Diamond Chain Mfg. Co., Indianapolis; B. G. Brennan, Inland Machine Works, St. Louis; Lloyd Brown, Lakewood Engineering Co., Cleveland; E. J. Buffington, Illinois Steel Co., Chicago; Julian Burdick, West Penn Steel Co., Brackenridge, Pa.; C. S. Burgess, Atlantic Steel Co., Atlanta, Ga.

Ira R. Calkins, Electric Wheel Co., Quincy, Ill.; C. E. Corrigan, National Metal Moulding Co., Pittsburgh; R. B. Carr, U. S. Steel Products Co., San Francisco; David J. Champion, Champion Rivet Co., Cleveland; E. N. Chilson, J. G. White Engineering Corporation, New York; Herbert G. Clopper, New Jersey Zinc Co., New York; F. W. Copeland, Sullivan Machinery Co., Chicago; A. H. Cordery, Phoenix Iron Co., Philadelphia; Maurice Coster, Westinghouse Electric Export Co., New York.

W. E. Davis, Goulds Mfg. Co., Seneca Falls, N. Y.; A. T. De Forest, United States Steel Products Co., San Francisco; G. A. Dickson, Pittsburgh Steel Co., Pittsburgh; B. Dixon, Industrial Works, Bay City, Mich.; M. V. Dreypool, Algoma Steel Corporation, Ltd., New York; John Duncan, Wheeling Steel & Iron Co., Wheeling, W. Va.

H. M. Easton, Weirton Steel Co., Weirton, W. Va.; C. R. Ellicott, Westinghouse Air Brake Co., New York; Clifford J. Ellis, Cambria Steel Co., Chicago; H. C. Ellis, Henry Disston & Sons, Philadelphia.

George Fink, West Penn Steel Co., Brackenridge, Pa.; Thomas Finigan, American Brake Shoe & Foundry Co., Chicago; Ralph E. Flanders, Jones & Lamson Machine Co., Springfield, Vt.

J. A. Gardner, Cincinnati Tool Co., Cincinnati; C. W. Gay, Electric Wheel Co., Quincy, Ill.; Charles S. Gingrich, Cincinnati Milling Machine Co., Cincinnati; A. E. Goodhue, Chicago Pneumatic Tool Co., Chicago; J. Goslin, Joubert & Goslin Machine & Foundry Co., Birmingham, Ala.; E. D. Graff, Joseph T. Ryerson & Son, Chicago; Frank W. Graves, Pollak Steel Co. of Cincinnati, Ohio, Chicago; H. F. Griffith, Westinghouse Electric Export Co., Pittsburgh.

S. E. Hackett, Jones & Laughlin Steel Co., Pittsburgh; Charles Wesley Hadden, Minneapolis Steel & Machinery Co., New York; Charles O. Hadley, Alan Wood Iron & Steel Co., Philadelphia; Norris L. Hall, Pennsylvania Steel Export Co., Philadelphia; E. L. Hartig, Joseph T. Ryerson & Son, Chicago; E. S. Hartig, Joseph T. Ryerson & Son, Chicago; Clarence E. Hawke, Carborundum Co., Niagara Falls, N. Y.; Col. P. R. Hawkins, Norton Grinding Co., Worcester, Mass.; Henry P. Hoffstot, Koppel Industrial Car & Equipment Co., Pittsburgh; J. C. C. Holding, Midvale Steel & Ordnance Co., Philadelphia; A. H. Holliday, Jones & Laughlin Steel Co., Pittsburgh; W. S. Horner, National Association of Sheet and Tin Plate Manufacturers, Pittsburgh; John Hughes, United States Steel Corporation; H. C. Hunt, National Automatic Tool Co., Richmond, Ind.

H. A. Jackson, Chicago Pneumatic Tool Co., Chicago; Homer C. Johnstone, Gaston, Williams & Wigmore, Inc., New York; F. H. Jones, Worthington Pump & Machinery Corporation, New York.

J. S. Keefe, American Steel & Wire Co., Chicago; M. B. Kelly, American Steel Co., Pittsburgh; J. J. Kennedy, National Tube Co., Pittsburgh; M. E. Kennedy, Kennedy Valve Mfg. Co., Elmira, N. Y.; T. J. King, Diamond Chain Mfg. Co., Indianapolis; L. E. Kittle, American Rolling Mill Co., Middletown, Ohio; Edward S. Knisely, Bethlehem Steel Co., South Bethlehem, Pa.; H. K. Kraut, Joseph T. Ryerson & Son, Chicago.

Frank J. Lanahan, Fort Pitt Malleable Iron Co., Pittsburgh; C. F. Lang, Lakewood Engineering Co., Cleveland; Charles A. Lindstrom, Pressed Steel Car Co., Pittsburgh; L. W. Lyons, Westinghouse Electric & Mfg. Co., Pittsburgh.

J. F. MacEnulty, Pressed Steel Car Co., New York; A. L. Martin, Liberty Steel Products Co., San Francisco; W. H. Mason, Federal Export Corporation, New York; James A. McCrory, American Steel Co., Pittsburgh; L. G. McDonald, American Wire Fabrics Co., Chicago; Harry L. McGee, Concrete Steel Co., New York; Julian T. McGill, Westinghouse Electric Export Co., New York; Roy C. McKenna, Vanadium-Alloys Steel Co., Latrobe, Pa.; S. B. E. McVay, Seneca Iron & Steel Co., Buffalo; H. D. Megary, Chicago Pneumatic Tool Co., Chicago; D. A. Merriam, American Steel & Wire Co., Chicago; Walter B. Merriam, Ames Iron Works, Oswego, N. Y.; J. H. Mitchell, Pressed Steel Car Co., Chicago; M. W. Mix, Dodge Mfg. Co., Mishawaka, Ind.; Henry S. Moos, American Machinery Syndicate, New York; William T. Morris, American Chain Co., Inc., New York; John A. Morton, Solvay Process Co., Syracuse, N. Y.

D. C. Noble, Pittsburgh Spring & Steel Co., Pittsburgh.

Charles D. Oesterlein, Oesterlein Machine Co., Cincinnati; C. J. Olmstead, Westinghouse Air Brake Co., Chicago; Roy G. Owens, Lakewood Engineering Co., Cleveland.

R. H. Parks, Canadian Car & Foundry Co., Ltd., Montreal, Que.; Enos Paullin, Ferracute Machine Co., Bridgeton, N. J.; J. S. Peden, Kennedy Valve Mfg. Co., Elmira, N. Y.; F. C. Pfister, Sullivan Machinery Co., Chicago; E. C. Pierce, Brown Hoisting Machinery Co., Cleveland; W. P. Pressinger, Chicago Pneumatic Tool Co., Chicago; John McC. Price, Mechanical Appliance Co., Milwaukee; C. E. Pynchon, Joseph T. Ryerson & Son, Chicago.

A. R. Rea, Fairbanks, Morse & Co., New York; J. L.

Record, Minneapolis Steel & Machinery Co., Chicago; W. E. Rowell, Whitman & Barnes Mfg. Co., Akron, Ohio; Louis D. Root, New York Wire Cloth Co., New York; D. M. Ryerson, Joseph T. Ryerson & Son, Chicago; J. T. Ryerson, Joseph T. Ryerson & Son, Chicago.

Hubert Sackett, N. K. Fairbanks Co.; V. A. Seuberth, Charles A. Schieren Co., New York; Alonzo B. See, A. B. See Electric Elevator Co., New York; James A. Slater, National Malleable Castings Co., Chicago; H. S. Smith, Joseph T. Ryerson & Son, Chicago; Walter D. Steele, Benjamin Electric Mfg. Co., Chicago; C. J. Stillwell, Warner & Swasey Co., Cleveland; W. P. Sutphen, New Jersey Zinc Co., New York.

J. A. Teach, Minneapolis Steel & Machinery Co., Minneapolis; Eugene P. Thomas, United States Steel Products Co., New York; O. E. Thomas, United States Steel Products Co., New York; George S. Tillotson, Sterling Grinding Wheel Co., Tiffin, Ohio; George P. Torrence, Jr., Link-Belt Co., Chicago.

Rawson Vaile, American Blower Co., Detroit; Theo. O. Vilter, Vilter Mfg. Co., Milwaukee, Wis.; W. F. Vosmer, Donner Steel Co., American Steel Export Co., Buffalo, N. Y.

H. T. Walsh, Sullivan Machinery Co., Chicago; Edward P. Welles, Charles H. Besley & Co., Chicago; C. R. Wells, Industrial Works, Bay City, Mich.; Edgar F. Wendt, Buffalo Forge Co., Buffalo Steam Pump Co., Geo. L. Squier Mfg. Co., Buffalo, N. Y.; R. S. White, American Steel & Wire Co., Chicago; Wilmer Wickersham, La Belle Iron Works, Chicago; A. G. Williams, Jr., American Steel Foundries, Chicago; L. W. Williams, Union Drawn Steel Co., New York; L. T. Wilmarth, Wilmarth & Morman Co., Grand Rapids, Mich.; C. E. Wilson, Worthington Pump & Machinery Corporation, New York.

Mississippi Valley Association Favors Gulf Ports

On Wednesday, April 23, one day prior to the opening of the foreign trade convention, there was an all-day and evening meeting of the Mississippi Valley Association, attended by 400 persons who hailed with enthusiasm plans for furthering the business, and especially the export business of the Mississippi Valley. The gathering was the first annual convention of the organization and its theme was "A whole-hearted co-operation of all the economic interests in the Valley is essential to a proper development of its tremendous resources and the attainment of its deserved business supremacy."

Although co-operation in general is given as the fundamental purpose of the Mississippi Valley Association, a principal idea is promoting exports from the territory by way of the Gulf ports—New Orleans, Galveston, Pensacola and Mobile. The territory embraced by the organization includes 22 States and the vast area lying between the Rockies and the Alleghenies and from the Canadian border to the Gulf, including all of Florida. John M. Parker, New Orleans, has been the active head of the movement, but at last week's meeting Harry H. Merrick, vice-president of the Central Trust Co., Chicago, and president of the Chicago Association of Commerce, was elected president.

As a result of the meeting, it is probable that two lines of endeavor will be followed within the main body. A committee of bankers was appointed to study a proposal to organize a bank, made up of banking interests in Middle Western cities, which would have a main headquarters in Chicago, and whose special function it would be to finance exports made by the Mississippi Trading Co., also to be formed. A suggestion that branch banks be located in South American countries did not win favor, it being considered better by the bankers to establish a strong home bank which would affiliate itself with already established foreign banks and work through them.

Several papers on trade subjects were read at the meetings conducted during the day and evening; a report was received from a committee which had been considering an economic policy for the Mississippi Valley, and another was received from a trade mission which had visited Mexico at the instance of the President of Mexico. John M. Parker made a stirring speech in which he asserted the Mississippi Valley territory was laying claim to its own and would have it. He voiced strong objections to Middle Western cities financing their South American purchases through New York.

Convention Notes

James A. Farrell was the subject of resolutions expressing appreciation for his sustained interest in the Council and the invaluable service he had given.

O. K. Davis also was complimented by resolution.

There were on hand 70 trade advisers whose province it was to assist in their special lines any manufacturers who needed advice. In the three days over 700 appointments were arranged.

Capt. Robert Dollar made an effective plea that the next convention be held at San Francisco.

The following cabled message was received from the Chinese Chambers of Commerce: "Greetings from merchants of sister republic. Welcome American co-operation in development of Chinese industries." To which this reply was sent by Mr. Farrell: "The National Foreign Trade Council acknowledges with great satisfaction greetings of the Chinese Chambers of Commerce and looks forward to large increase in trade and friendly relations with China."

Mr. Replogle Opposed to Steel Price Fixing

J. Leonard Replogle, chairman Wharton Steel Co. and director of steel supply at Washington during the war, has expressed himself very positively as to the Redfield plan of stabilization of steel prices. Mr. Replogle said in part:

"Business was showing a slight but consistent improvement at the time the Redfield committee was organized, and while buying was far below normal, operations at the mills were on a fairly satisfactory basis, many of the non-war industries, whose steel requirements were curtailed on account of the necessities of war, had reached the point where their stocks were depleted and they felt the necessity of buying at the best prices obtainable. Business was actually improving.

"The announcement of the plan to artificially regulate prices immediately caused cessation in the buying movement which had started. About three months have elapsed since it was announced that it was the intention of the Redfield committee to help stabilize business, but the only effect of this announcement and the deliberations since that time, has been to retard the development of business generally. The law of supply and demand is a natural process which cannot be helped by artificial methods or by any number of committees, regardless of how capable they may be."

Mr. Replogle also said that, as he understood it, Attorney General Palmer has not expressed his opinion on the legality of the stabilization plan. That fact of itself, he thought, is bound to create additional uncertainties even if the authorized buying agents of the Government and the manufacturers come into complete agreement.

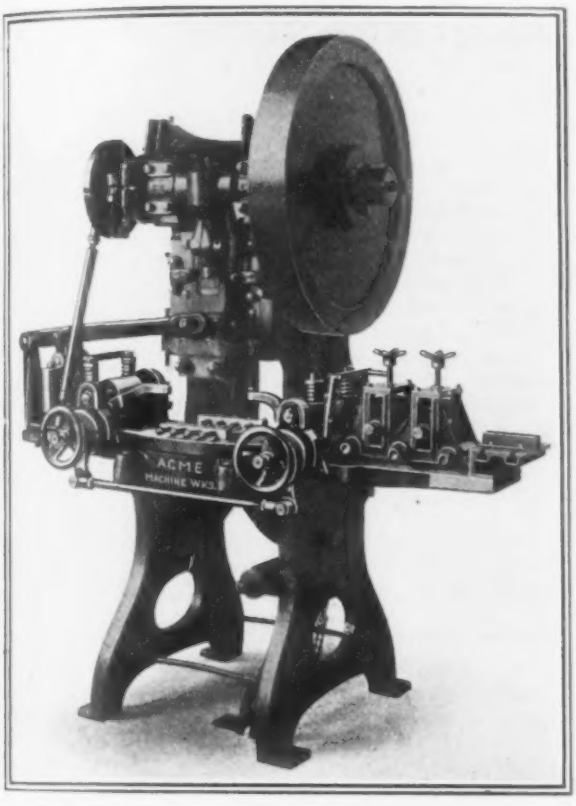
"I believe," said Mr. Replogle, "that the Director-General of Railroads is correct in his opinion that open market conditions should prevail. The rather general opinion that under open market conditions prices for steel products would sag to a considerable extent, is, I believe, a fallacy which would be very quickly dissipated, as the prevailing costs of the steel manufacturers, large and small, are such that this would not be possible. As a matter of fact, under the law of supply and demand it is quite probable that the price of many commodities would shortly be considerably in excess of the schedule now under discussion.

"I have the greatest possible admiration for the committees of steel manufacturers and also the Industrial Board of the Department of Commerce—all men of great ability who have contributed wonderful service throughout the war period, but if they now disband and go home, I believe the best interests of the country will be served, as even those who were favorable to the plan originally now recognize that whatever merit it had, if all Governmental agencies had promptly endorsed the plan, has been lost."

Roll Feeds for Punch Presses

The Acme Machine Works, 4125 Ravenswood Avenue, Chicago, has brought out a line of roll feeds for punch presses. The roll feeds are mounted on their own bolster plate, which is made to fit any make or size of press.

The stock first passes through the straightening rolls, which run on roller bearings and are adjustable



This Roll Feed Is Provided with a Straightening Device and Scrap Cutter

by hand wheels for any weight or stiffness of stock. From the straightening rolls the stock passes to large diameter feed rolls, which are fitted with a special drive having from five to seven pawls each having a toggle grip action. The action of this driving device is emphasized in that the pawls take hold the instant the direction of rotation of the driving housing is reversed, thus to assure accurate and noiseless feeding and fine adjustment at high speed.

A cutting attachment cuts the scrap into small pieces which may drop into a barrel or box, thus relieving the operator of handling the stock and avoiding the necessity of baling. In cases where the stock has to be fed up against a stop pin an automatic feed cut-out can be furnished for the purpose of eliminating slippage of the rolls on the stock, as this slippage wears grooves in the rolls. It is pointed out that with these attachments one operator can handle from two to three presses.

Agricultural Implements in Canada

WASHINGTON, April 29.—With an invested capital of approximately $70,000,000 the agricultural implement industry of Canada produced almost $17,000,000 worth of machinery in 1917, more than double the 1915 output, according to the preliminary figures of the Dominion Bureau of Statistics. The census covered altogether 90 establishments. These are located as follows: Alberta, 1; Manitoba, 7; Nova Scotia, 1; Ontario, 56; Prince Edward Island, 1; Quebec, 21 and Saskatchewan, 3.

The total capital invested amounted to $70,493,801, divided as follows: Land, buildings and fixtures, $13,381,463; machinery and tools, $6,140,082; materials on hand, stocks in process, finished products, fuel, etc., $23,127,626; cash, trading and operating accounts and bills receivable, $27,844,630. The total capital invested represents an increase over 1915 of $10,964,710, or of 18.4 per cent.

Long Distance Motor Truck Transport

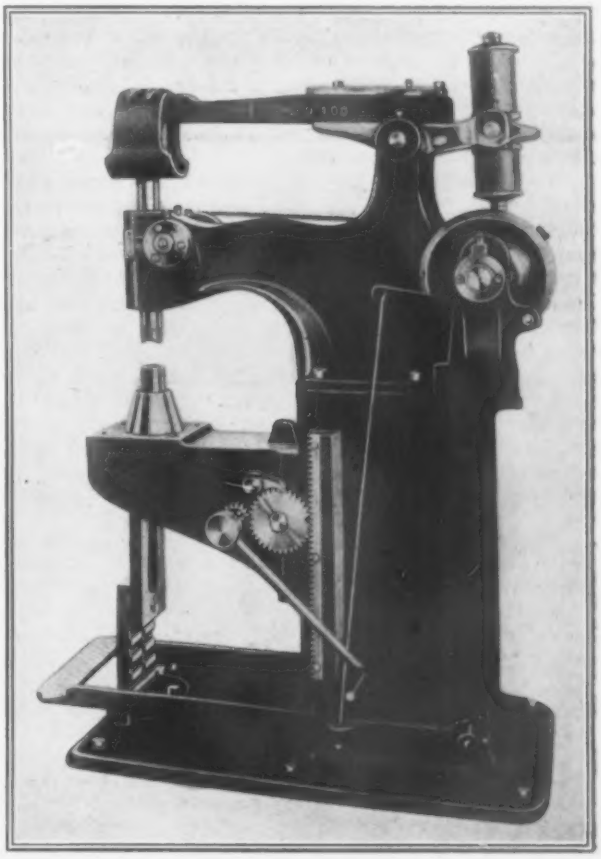
How the problem of motor transportation will be solved is discussed by R. E. Fulton, vice-president International Motor Co. He considers the main problem the building of smooth and lasting roads that can endure the punishment of heavy truck traffic. The chief uses and advantages of trucks as proved by the war transportation emergency are for replacing railroad spurs; for eliminating freight handling; relieving railroad congestion at terminals, and insuring prompt delivery.

Distances considered practical for motor truck transportation by various authorities average from 100 to 300 miles, though the Goodyear Tire & Rubber Co. operates a fleet from Akron, Ohio, to Boston, a round trip of 1560 miles being made in from six to nine days, depending on the weather and road conditions. They are driven between terminals with no stops other than for meals and supplies. Each truck is manned by two drivers, one of whom drives while the other sleeps.

Hammer for Cold Riveting

The high-speed riveting hammer, illustrated, is being marketed by the High-Speed Hammer Co., Rochester, N. Y. The vibrator, which is the connecting link between the hickory helve and rubber cushions, constitutes the non-crystallizing member through which all shock is transmitted to the hickory helve where it is absorbed. This vibrator is a solid bronze member and weighs 40 lb. The eccentric and rear main shaft are made from one solid piece of special steel ground to precision. In connection with this, ball thrust bearings are used; also housed within the eccentric strap and around the eccentric is a Hyatt roller bearing. The anvil block is provided with rack and pinion and gear for easy adjustment. The pein in revolved by means of a worm and worm gear.

The net weight of the hammer is 1½ tons. The height over all is 6 ft., length of hickory helve 2 ft.



High Speed, Cold Riveting Hammer for Producing Round Heads ⅝-In. to ¾-In. and Oval Heads ⅞-In. to 1½-In.

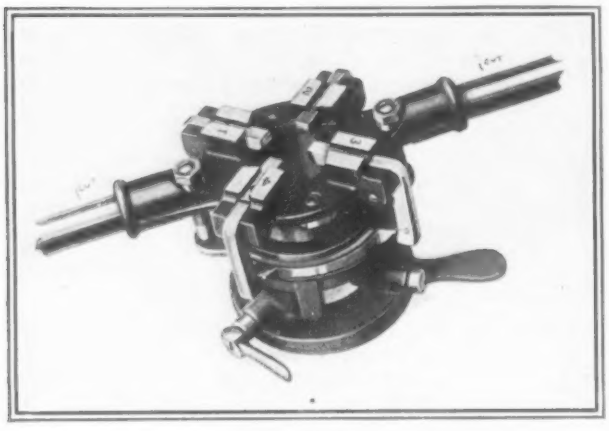
8 in.; horizontal gap 16 in.; vertical gap 16 in.; dimensions of base 2 ft. by 3 ft. 8 in.

The machine produces full round heads cold ⅝-in. to ¾-in. and oval heads ⅞-in. to 1½-in. inclusive.

Receding Pipe Threader

A new receding pipe threader has recently been added to the line of tools manufactured by the Greenfield Tap & Die Corporation, Greenfield, Mass. Two special advantages are claimed for the tool: Quick release of the chasers at the end of the cut and quick resetting to cutting size.

In operation the tool is wound upon the pipe until a thread of the desired length has been cut, after which



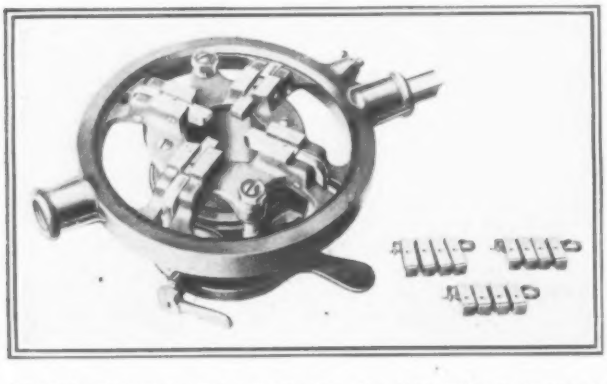
Receding Pipe Threader Designed for Quick Release of the Chasers and Quick Resetting. In order to reduce friction, the chasers are made to travel along the pipe parallel to the thread instead of parallel to the axis of the pipe

the threader may be pulled straight off. It is stated that this tool "leads" on easily and that the action of the tool becomes freer as it is advanced upon the work. To return the threader to its original cutting position it is merely necessary to release the lead screw, lift the head, reset the trigger and begin another cut. None but the actual cutting teeth follow around the threads.

The chasers are narrow and travel along the pipe parallel to the thread they are cutting, and not parallel to the axis of the pipe, thus to reduce friction. The chasers are interchangeable and it is possible to replace a single chaser in case of breakage. Under such conditions the replaced chaser will follow or "track" uniformly with the balance of the set, making it unnecessary to buy an entire new set of chasers when one becomes unfit for further use.

At the beginning of the operation the chasers cut a full depth thread, and as the work progresses the levers which support the chasers gradually change their position, permitting the chasers to recede until they have finally backed completely away from the pipe. Then the threader can be pulled off the pipe, avoiding loss of time in unwinding. A single turn of either of three lugs disengages the lead screw, so that the head may be pulled back to the original position and reset.

A three-jawed universal chuck guide is provided, and after the jaws are tightened against the pipe the chuck is tightened by one turn of a grip screw working inside of the chuck. The jaws will take a coupling of the largest pipe size that comes within the range of



Ratchet Receding Pipe Threader for Use Where Space Is Limited. The head is designed so that the pulling strain of the handles comes directly back of and in line with the chasers, thus to minimize the pull and prevent trouble caused by twisting strains

the tool. Adjustment may be made for cutting shallow or deep threads, such adjustment being made by changing the setting of the lock nut and adjusting rods that project through the head of the threader.

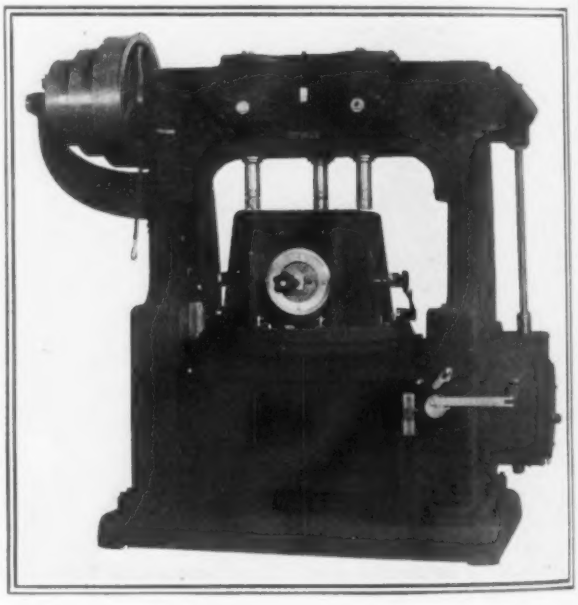
The lead nut is made of three segments which clean themselves and no dirt or chips, it is stated, can gather on the lead screw. Both the lead screw and nut are replaceable without requiring the tool to be returned to the factory.

The threader is regularly furnished with one set of narrow chasers for each pipe size, Briggs standard right-hand threads being furnished unless otherwise specified, but chasers for cutting Whitworth standard threads can be furnished.

To provide for the performance of pipe-threading operations where the amount of space is limited, a ratchet receding pipe threader is also manufactured. In its general arrangement this tool is similar to the regular receding threader. The ratchet mechanism represents the only change and it is incorporated in the die stock instead of being made an attachment. The threader is made with two-handle lugs and two handles are furnished with the tool. When it is to be used with the ratchet mechanism one of these handles is taken off and the tool will then swing in a 14-in. circle, but it is possible to disengage the ratchet, screw the second handle into place in its lug, and use this tool just as the regular receding pipe threader is operated.

Cylinder Boring Machine with Circular Jig

A vertical cylinder boring machine, with circular indexing jig, has recently been perfected by the Defiance Machine Works, Defiance, Ohio. This machine is furnished in three sizes which measure 36 in., 48 in. and 60 in. between housings. Either of these sizes can be fitted with two or three spindles, or two or three groups of spindles. When fitted with three groups of spindles it will simultaneously rough bore, semi-finish and ream gas engine cylinders of either single units or a number of units cast en bloc.



The Circular Indexing Jig on This Boring Machine is Designed to Hold Four Units. The finished unit is replaced while the other three are being machined.

The circular indexing jig is designed to hold four units, and while the operator is replacing a finished unit, one unit is being rough bored, the second unit is being semi-finished, and the third unit is being reamed. When the machine is furnished with two spindles or two groups of spindles, it will rough bore and ream in one operation. By either of these methods the machine is constantly producing and no time is lost in unloading or reloading the jig.

The speed and feed mechanisms resemble those in the company's vertical cylinder boring machine described in THE IRON AGE, issue of March 13.

WILL HOLD WAR PLANTS

Government's Plan to Meet Any Emergency—Secretary Crowell's Statement

WASHINGTON, April 29.—To provide for future war requirements of artillery material the War Department has announced that 12 manufacturing plants and depots and three Government arsenals—with plants valued at $250,000,000—will be kept equipped for instant work. During the war there were 43 of these plants, besides the Government arsenals. It will require about $9,000,000 of additional expenditures to put these plants in shape for the work, although in most of them tools and equipment will merely be stored ready for any emergency.

The following table contains the list of arsenals and ordnance plants which will be retained, with the amounts already expended, and the money still required to complete them according to the program which has been outlined by the Ordnance Department:

Location	Present Value	Needed for Completion
Watervliet, N. Y., arsenal	$18,500,000	$560,000
Watertown, Mass, arsenal	19,110,000	600,000
Rock Island, Ill., arsenal	31,600,000	650,000
Old Hickory, Nashville, Tenn.	88,000,000	100,000
Frankford, Pa.	7,303,000	1,405,000
Edgewood, N. J.	35,000,000	417,000
Amatol, N. J.	.....	50,000
Tullytown, N. J.	.....	75,000
Springfield, Mass	3,600,000	300,000
Madison, Wis.	1,477,000	300,000
Chicago	7,103,000	1,782,475
Detroit	9,445,000	350,000
Erie, Pa.	3,995,000	500,000
Rochester, N. Y.	4,337,000	300,000
East Springfield, Mass.	4,027,000	1,300,000

The last six on this list are on leased ground, but the amount specified as needed for completion would cover the purchase of the land.

Ready for Emergency

The purpose of the plan is to maintain sufficient plants to begin the immediate manufacture of any quantity that might be needed in case of an emergency, and to maintain on hand sufficient numbers of jigs, fixtures and special tools, so that by transferring these and specially trained workmen to private plants quantity production can speedily be established. The larger share of the facilities to be maintained will be for the manufacture of guns and recuperators, as these are the most difficult to produce in commercial plants. Gun carriages and gun forgings can more easily be secured by the modification of private industrial plants.

The announcement of the new policy was made by Acting Secretary Crowell, who is also Director of Munitions. It was based on a special report made by the Chief of Ordnance.

"During the war," said Mr. Crowell in his announcement, "over $130,000,000 was expended in the building up and increasing facilities of 43 different plants and three Government arsenals for the manufacture of artillery material alone. This expenditure has been made in some cases in a small amount for the extension of facilities of commercial manufacturers, while in other cases it has been used to develop large specialized manufacturing establishments like that developed under the supervision of the Dodge Brothers, Detroit, which covers 11 acres of floor space and includes facilities and equipment valued at $10,000,000.

Marvellous Success

"These facilities were developed for all purposes, as the manufacture of forgings for guns, the manufacture of all calibers and types of guns, gun carriages and recuperators. Especially in the manufacture of guns and recuperators the resourcefulness and ability of the American manufacturers have been taxed to the utmost. They have succeeded to a marvelous degree in meeting the demands of the War Department for artillery material. Delays have occurred, however, in obtaining production of artillery material, as many new manufacturing plants and a tremendous amount of special machinery had to be built before artillery material could be produced.

"To be able to meet the manufacturing requirements under any future emergency, the Chief of Ordnance has made a study of the probable requirements for the manufacture of material and has obtained the approval of the Secretary of War for the retention of certain facilities and equipment to meet these requirements.

"Under this project facilities for the production of guns and recuperators will be held by the Ordnance Department up to a capacity estimated to meet future requirements. Very small facilities will be held for the manufacture of gun carriages and gun forgings, as these can be obtained by modification of the equipment of commercial manufacturers without serious delays. However, by saving facilities for the production of guns and recuperators, several months' time will be saved at the beginning of an emergency, as this material requires entirely special manufacturing plants and special purpose machinery for its manufacture.

"It is not expected to operate production plants for the material mentioned, but merely to hold them as 'standby' plants. To meet the needs of peace time manufacture and to manufacture new types of artillery material which may be developed as a result of the large amount of experience obtained during the war, the arsenals will be held equipped for the manufacture of all calibers and types of material.

"To obviate the delay of getting into production from lack of knowledge of the best methods of production and to provide skilled workmen to be transferred in case of necessity to other plants, there will be built up at the arsenals small production units for each type and caliber of material. These production units will include the least number of all types of machines which it is practicable to install, and will be used from time to time for the manufacture of small quantities of artillery material, using the same jigs, fixtures and special tools as are required for large scale production.

"Under this policy, Watervliet Arsenal will be employed as developing center of the gun industry, Rock Island Arsenal for mobile gun carriages and recuperators, Watertown Arsenal for gun forgings, heavy siege, and railway and seacoast carriages and recuperators.

"The project as outlined above will require the transfer of much machinery to the arsenals and to the manufacturing plants which will be held for the replacement of machinery which is now worn out and for the extension of arsenal facilities. In addition a considerable quantity of special purpose machinery will be placed in storage and held available for using in case of emergency."

Portable Electric Tool Association

The Portable Electric Tool Association held its annual meeting at the Sinton Hotel, Cincinnati, April 24-25. W. J. Friedlander, of the Hisey-Wolf Machine Co., president of the association, presided. Reports from different committees were received, and one of the most interesting ones concerned export business. In the discussions that ensued it was brought out that American manufacturers of portable electric tools would have to co-operate more closely to obtain a fair share of foreign business.

The members present all stated that they were receiving a large number of requests for agency representations, and also that European machinery importers were visiting their plants with the idea in view of making selling arrangements. The general opinion was that the outlook is very good, but it is not expected that any large percentage of the inquiries now in hand will develop into orders at an early date.

A resolution was unanimously passed by the association to ally itself with the Electric Power Club, a national organization, and this branch will be known as the Portable Electric Tool Section. W. J. Friedlander was re-elected president.

The J. R. Torrey Razor Co., Worcester, has awarded the contract for an addition to its blacksmith shops, which will require additional forges.

Marked Change in Kind of Exports

Iron and Steel Products for Use in Pursuits of Peace Take Place of War Materials—Value for March Higher Than for Same Month of 1918

WASHINGTON, April 29.—Exports of iron and steel from the United States are still high. The March figures of the Bureau of Foreign and Domestic Commerce reveal an increase of more than $5,000,000 in the outgo of iron and steel compared with the same month a year ago, but a decrease compared with February, 1919. In March, 1919, the exports of iron and steel were valued at $84,720,804 against $79,175,909 a year ago. The February, 1919, total was $87,841,600 and the January, 1919, total $81,853,648.

For the nine months ending with March, 1919, however, the figures are less than for the two preceding years. This is due to the enormous exportation of war materials in those years. For the nine months ending March, 1919, the exportation of the manufactures of iron and steel were valued at $770,875,472 against $857,271,541 for the same period of 1918, and $803,900,523 in 1917.

Exports of Iron and Steel

	March		Nine Months	
	1918 Gross Tons	1919 Gross Tons	1918 Gross Tons	1919 Gross Tons
Ferromanganese	101	17	3,634	1,133
Ferrosilicon	40	87	8,261	3,996
All other pig iron	9,708	22,054	307,181	246,315
Scrap	307	125	21,806	1,526
Bar iron	2,589	8,861	38,605	67,658
Wire rods	11,063	13,769	149,082	112,187
Steel bars	48,135	37,595	469,700	353,848
Billets, ingots and blooms, m.e.s.	144,443	8,176	1,502,962	833,927
Bolts and nuts	2,275	3,631	23,749	27,325
Hoops and bands	5,878	3,832	46,706	42,272
Horseshoes	377	256	8,104	1,383
Cut nails	347	374	3,529	2,715
Wire nails	6,161	8,136	91,557	63,225
All other nails, including tacks	854	1,928	10,704	12,889
Cast-iron pipes and fittings	5,134	2,211	61,893	27,958
Wrought pipes and fittings	5,174	16,188	81,028	91,846
Radiators and cast-iron house-heating boilers	131	209	2,339	2,485
Railroad spikes	754	1,869	12,054	9,958
Steel rails	24,600	48,955	314,317	422,046
Galvanized sheets and plates	5,884	9,039	60,147	52,666
All other sheets and plates	4,565	3,582	43,774	209,861
Steel plates	25,049	82,305	385,214	522,647
Steel sheets	16,006	1,575	129,780	102,285
Ship plates, punched and shaped	2,266	809	24,720	16,574
Structural iron and steel	20,283	28,075	191,755	211,782
Tin and terne plates	16,336	29,244	159,684	191,355
Barbed wire	12,244	7,550	129,864	171,221
All other wire	11,491	17,823	134,117	128,729
Total	382,195	344,506	4,376,766	3,918,029

The tonnage exports showed a decrease. In March, 1919, the gross tonnage of iron and steel exported was 344,506 against 382,195 gross tons in March, 1918. But they showed a decided increase over the February, 1919, tonnage, which totaled 234,793. For the nine months ending March, 1919, the total was 3,918,029 gross tons against 4,376,766 gross tons for the nine months a year ago.

The biggest slump was again reported in the exportation of billets, ingots and blooms which fell from 144,443 tons in March, 1918, to 8176 in March, 1919. Steel bars also slumped from 48,135 gross tons a year ago to 37,595 in March, 1919. On the other hand, pig iron exports increased from 9,849 tons in March, 1918, to 22,158 in March, 1919. Wrought pipes and fittings rose from 5,174 gross tons in March, 1918, to 16,188 in March, 1919. The export of steel rails was almost doubled, rising from 24,600 to 48,955 gross tons. Of the latter figure, France received 18,131 tons and Japan 6060.

Steel plate exports jumped from 25,049 gross tons in March, 1918, to 82,305 for March, 1919. It is interesting to note how this increase was distributed. The exportations to France fell from 10,886 tons in March, 1918, to 4935 in March, 1919, but the exportation to Japan jumped from 1014 tons a year ago to 35,170 in March, 1919, and to Canada from 10,109 to 19,888 tons.

The official figures showed a decided decrease in sheet steels, falling from 16,006 a year ago to 1575 for March, 1919. In the light of the heavy increase in steel plate exports it is possible that some of the customs offices have mixed their figures on plates and sheets. According to the figures, however, the exportation of steel sheets to Canada fell from 8300 gross tons in March, 1918, to 3069 in March, 1919, and to Japan from 4711 a year ago to 3446 last month.

The export of structural iron and steel rose from 20,283 gross tons a year ago to 28,075 in March, 1919. Here again the Japanese purchaser was responsible for the increase, the exports to that country going from 1259 tons a year ago to 10,148 for last month. The exports to Canada fell from 14,973 to 9190.

In tin and terne plates there was also a decided increase, from 16,336 in March, 1918, to 29,244 in March, 1919. Here again the Japanese secured the lion's share, their figures rising from 1066 tons a year ago to 7259 for last month. Canada received 3183 tons, the Argentine 3793 and Uruguay 3065.

The exportation of barbed wire continues to reveal the revolutionary effect of peace. Here the exportation fell from 12,244 tons in March, 1918, to 7550 tons for last month. But where France received 4262 tons in March, 1918, only 30 went to that country last month, and Italy, which received 4469 tons in March, 1918, received none at all in March, 1919. Practically all our exports of barbed wire went to South America, Brazil alone receiving 2560 tons. "All other wire" increased from 11,491 tons in March, 1918, to 17,823 in March, 1919, Argentine received 4487 tons and Japan 2592.

The exportation of machinery kept pace with the general increase in the foreign trade in iron and steel. The machinery exports increased in value from $22,984,551 in March, 1918, to $28,554,382 in March, 1919. This made a total of $213,107,035 for the nine months ending with March, 1918, and of $234,600,208 in March, 1919. Metal-working machinery increased from $4,130,839 to $5,015,764, and sewing machines from $554,633 in March, 1918, to $1,515,043 in March, 1919. It is interesting again to note the increase in exportations to Japan. In March, 1918, that country bought only $183,395 worth of metal-working machinery, which rose in March, 1919, to $1,078,748. Her imports of Amer-

Imports of Iron and Steel

	March		Nine Months	
	1918 Gross Tons	1919 Gross Tons	1918 Gross Tons	1919 Gross Tons
Ferromanganese	3,555	5,741	20,807	17,305
Ferrosilicon	337	231	5,173	5,493
All other pig iron	90	924	16,068	1,534
Scrap	3,849	8,579	55,574	65,357
Bar iron	189	15	2,299	1,216
Structural iron and steel	63	5	6,721	2,172
Steel billets without alloys	1,888	.....	30,216	21,546
All other steel billets	921	416	6,745	4,569
Steel rails	1,235	1,127	7,611	8,497
Sheets and plates	289	58	1,916	486
Tin and terne plates	.....	1	33	1
Tin scrap	453	528	6,096	5,352
Wire rods	1,443	7	2,877	1,926
Total	14,312	17,632	162,135	135,312

Imports of Manganese Ore

Manganese, ore and oxide of	19,300	48,238	431,718	361,788

Exports of Machinery

	March		Nine Months	
	1918	1919	1918	1919
Milling machines	$79,561	$404,927	$1,541,439	$2,221,062
Air-compressing machinery	150,147	250,111	1,025,424	2,342,944
Brewers' machinery	11,348	5,801	226,266	64,850
Cash registers	42,647	333,541	386,340	1,212,521
Parts of	6,162	12,312	50,334	109,992
Concrete mixers	15,685	12,927	206,697	196,801
Cotton gins	28,558	44,079	110,634	179,004
Cream separators	57,234	96,632	393,044	677,535
Elevators and elevator machinery	153,907	213,779	1,528,028	1,941,497
Electric locomotives	17,000	35,687	122,679	223,452
Gas engines, stationary	15,456	48,356	459,775	414,972
Gasoline engines	4,420,831	2,048,415	22,807,906	25,005,300
Kerosene engines	827,320	551,118	3,698,291	6,875,283
Steam engines	1,906,431	1,056,230	30,679,236	19,916,781
All other engines	644,640	147,690	2,221,582	4,019,187
Boilers	157,866	511,403	2,943,224	4,336,241
Boiler tubes	367,404	778,000	4,895,656	6,050,802
All other parts of engines	1,780,010	1,530,151	12,704,630	18,894,490
Excavating machinery	**91,983**	**78,281**	708,490	729,452
Milling machinery, flour and grist	135,013	281,038	730,666	1,226,838
Laundry machinery, power	42,046	38,206	298,297	346,220
All other	21,332	16,618	215,606	226,021
Lawn mowers	19,096	54,933	176,148	263,514
Lathes	825,658	1,012,847	12,950,736	6,909,016
Other machine tools	828,089	870,663	8,088,055	9,245,941
Sharpening and grinding machines	603,844	485,959	4,883,060	4,585,134
All other metal-working machinery	1,873,248	2,646,295	18,742,794	19,280,081
Meters, gas and water	40,128	79,864	371,607	453,840
Mining machinery, oil well	123,572	414,589	1,445,457	2,714,993
All other	1,286,616	947,898	8,313,575	6,918,823
Paper-mill machinery	84,401	377,884	1,355,866	1,700,863
Printing presses	106,050	211,798	1,050,144	1,681,904
Pumps and pumping machinery	469,857	786,212	4,903,867	5,024,847
Refrigerating and ice-making machinery	104,296	264,324	1,100,756	1,495,887
Road-making machinery	70,100	98,814	379,912	585,518
Sewing machines	554,633	1,515,043	6,129,646	8,557,056
Shoe machinery	120,310	185,664	1,232,996	1,340,603
Sugar-mill machinery	415,241	727,287	10,034,786	8,492,642
Textile machinery	418,888	959,956	3,697,645	7,273,976
Typesetting machines	161,065	568,866	968,118	1,989,422
Typewriting machines	592,106	1,529,546	5,771,836	7,133,299
Windmills	54,070	67,985	892,870	694,320
Wood-working machinery, saw mill	77,199	163,203	699,699	1,173,736
All other	69,100	164,834	774,573	955,232
All other machinery and parts of	3,116,103	5,942,616	31,168,643	38,918,216
Total	$22,984,551	$28,554,382	$213,107,035	$234,600,208

lean sewing machines rose from $57,462 in March, 1918, to $263,297 in March, 1919.

The imports of iron and steel into the United States fell from $2,719,264 in March, 1918, to $2,493,802 in March, 1919. The February, 1919, total was $2,061,705. For the nine months ending with March, 1919, the aggregate imports were $9,272,311 against $18,578,460 a year ago.

The tonnage of iron and steel imports showed a slight increase, rising from 14,312 gross tons in March, 1918, to 17,632 gross tons in March, 1919. The biggest elements in the increase was that of pig iron, in its various forms, which rose from 3982 gross tons in March, 1918, to 6896 tons in March, 1919, and scrap iron, which rose from 3849 gross tons in March, 1918, to 8579 tons in March, 1919. For the nine months ending March, 1918, the total imports of iron and steel were 162,135 gross tons and for the nine months ending March, 1919, this figure fell to 135,352 tons.

The importation of manganese ore and oxide of manganese showed a stiff recovery in March, 1919, rising to 48,238 gross tons against 19,300 tons in March, 1918, and 21,819 tons in February of this year.

O. F. S.

Belgian War Output of Iron and Steel

Further data regarding Belgium's war output of iron and steel is available, supplementing that published in THE IRON AGE, April 3, 1919, as follows:

In 1917 only one steel plant was operating and only one furnace in blast. The pig iron output was only 2460 metric tons of Bessemer and 5530 tons of steel-making (open hearth) iron. The total output of finished steel was 23,630 tons and of finished iron 51,620 tons. The following table gives the data from 1913 to 1917 in metric tons:

	Pig Iron	Finished Steel	Finished Iron
1913	2,484,690	1,409,460	304,350
1914	1,454,490	866,350	151,110
1915	68,150	94,270	38,090
1916	127,825	61,900	101,300
1917	7,990	23,630	51,620

The production of steel rails fell from 341,870 tons in 1913 to 29,470 tons in 1915 and 730 tons in 1917, and of beams from 175,210 tons in 1913 to 5490 tons in 1915 and 60 tons in 1917. The merchant steel output is given as 518,370 tons in 1913, as 36,680 tons in 1915, and as 8950 in 1917.

Sweden's 1918 Iron and Steel Output

The output of iron and steel in Sweden in 1918, according to statistics published by the Association of Swedish Iron and Steel Works, was as follows in metric tons as compared with 1917:

	1918	1917
Pig iron and direct castings	749,800	821,200
Puddled iron, blooms, etc.	92,000	114,100
Bessemer ingots	66,500	76,900
Open-hearth ingots	458,300	489,700
Rolled and forged iron and steel	361,400	378,000

[Crucible and electric ingots were not given separately.]

In 1918 Sweden exported 4,486,000 tons of iron ore as compared with 5,613,000 tons in 1917. The pig iron exports were 180,113 tons in 1918 as against 231,244 tons in 1917. The total iron and steel exports in 1918 were 183,753 tons, which compare with 230,204 tons in 1917 and 299,086 tons in 1916.

Italy's Pig Iron and Steel Output in 1917

The pig iron output of Italy in 1917 as compared with 1916 was as follows, according to *Rivista del Servigio Minerario* in metric tons:

	1917	1916
Coke pig iron	410,224	443,464
Charcoal pig iron	4,440	6,630
Electric pig iron	56,524	17,298
Totals	471,188	467,392

The steel output was as follows in metric tons:

	1917	1916
Bessemer steel	23,200	39,581
Open-hearth steel	1,235,962	1,182,417
Crucible steel	1,290	710
Electric steel	36,948	22,376
Castings	35,441	24,402
Totals	1,331,641	1,269,486

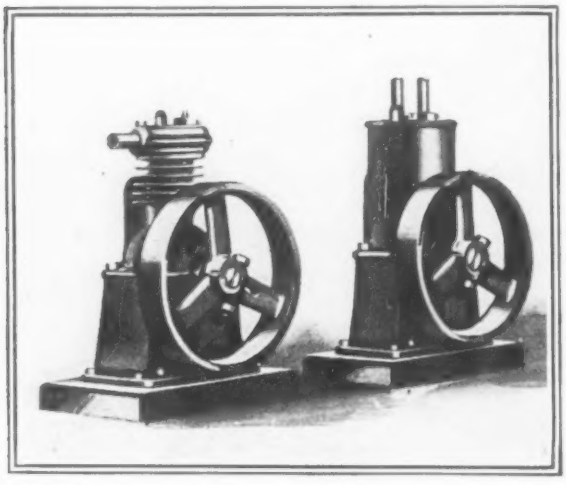
The iron ore output in 1917 is reported as 993,825 tons as compared with 942,244 tons in 1916. The 1917 manganese ore production was 24,532 tons as against 18,147 tons in 1916.

The large production of electric pig iron in 1917 is striking.

The Sundstrom Mfg. Co., Thirty-second Street and Shields Avenue, Chicago, has changed its name to Rex Machine Co., and will make automotive air equipment in addition to dies and tools.

New Small Air Compressors

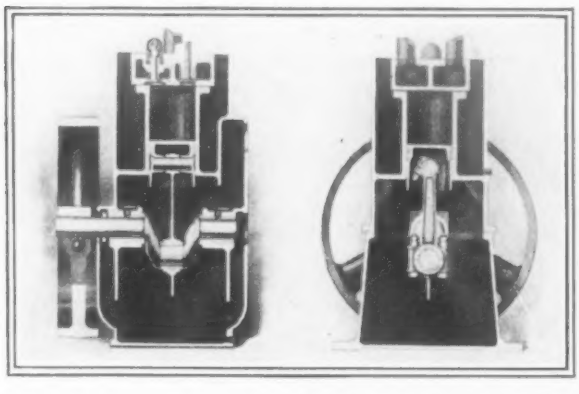
The Ingersoll-Rand Co., 11 Broadway, New York, has placed on the market new standard type small compressors, a number of which have been manufactured and tested out during the war period. They are built in four sizes with a capacity range running from 3 to



Small Size Air Compressor Built Either with Ribbed Cylinder or with Water Cooled Cylinder. Larger machines are water cooled employing the reservoir jacket system. The largest machine is also furnished with closed jacket for connection to a pressure system

45 cu. ft. per min. at pressures to 100 lb. per sq. in. The small compressors can be used for pressures up to 200 lb. per sq. in., the horsepower required, however, being slightly increased. They are single acting machines of the vertical type built for belt drive and in general design resemble an automobile engine in that there is the same drop forged crank shaft and connecting rod, the die cast renewable bearings and the automatic splash lubrication system.

The smaller compressor is built with ribbed cylinder for air cooling where the service is intermittent and with water cooled cylinder of the reservoir type for continuous operation. Larger machines are water-cooled only, employing the reservoir jacket system except that in the case of the larger size a closed jacket for connection to a pressure system is optional. In



Section of Ingersoll-Rand Small Size Air Compressor with Reservoir Water Cooling

the reservoir cylinder design both the cylinder barrel and head are cooled, sufficient water being retained, the manufacturer states, to suffice for a 10-hour run.

The first cargo of ore for the 1919 season received at the blast furnaces of the Carnegie Steel Co. at Farrell, Pa., was on April 23, and consisted of 10,000 tons. This is the earliest date Lake navigation has opened since the Farrell furnace was built. The initital ore shipment was received last week at the Conneaut docks.

The War Savings Stamp Committee, A. H. Anderson, chairman, of the Norton Co., Worcester, Mass., reports that 2816 employees bought $181,880 worth of stamps during the year ending March 22.

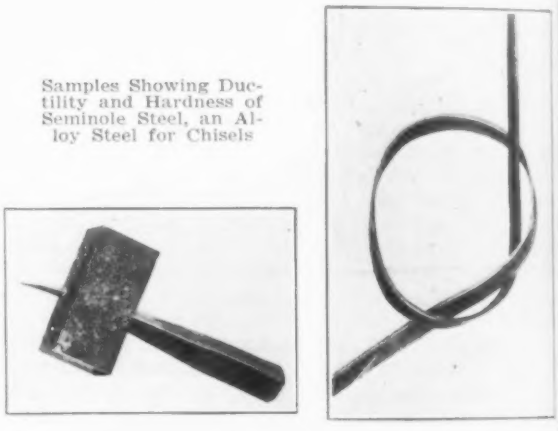
New Steel for Chisels

The Ludlum Steel Co., Watervliet, N. Y., announces that it has produced an alloy chisel steel which can be made so hard that it will cut glass yet may be bent by being hammered over the edge of an anvil. This steel, the manufacturer states, has a wide temperature range, as it may be heated anywhere between 1650 and 1950 deg. Fahr., and yet give good results.

The steel seems to have its greatest value when heated to 1750 to 1800 deg., quenched in oil and slightly drawn. The drawing, it is stated, does not seem to affect the hardness of the steel, but it helps the toughness. Many theories can be evolved as to just why this slight drawing is of such assistance to this steel, but metallographically there is no evidence of difference between straight hardening and hardening and drawing. The same structure can be produced as seen under the microscope, yet there is a great deal of difference between the two heat treatments.

The Ludlum Steel Co., following its usual custom of giving Indian names to its various brands of steel, has called this new steel Seminole. P. A. E. Armstrong, vice-president of the company, is responsible for its invention and development.

A point emphasized is that the head of a chisel made of Seminole steel will not sliver. It is also stated that the head of the chisel can be heat treated so that it is fileable, yet it will not break out or crack. It



Samples Showing Ductility and Hardness of Seminole Steel, an Alloy Steel for Chisels

will spread, but it will not split, yet the top of the head does not take on a very glassy surface and seems to have a grip on the hammer-face when it is struck.

It is pointed out that metallographically the steel is peculiar. It seems to have a very fine structure, which is difficult to define. It may be solid solution which is generally regarded as austenite, or it may be martensite. It seems under the microscope to have an appearance at lower magnification of the whole range of solid solution steel, yet it has the characteristics of none. Under high magnifications of 1200 diameters the structure appears to be somewhat like martensite, yet the martensite appears to be lamellar rather than the usual 60 deg. marking.

The grain boundaries, which are particularly tenacious, have the coloring effect of troostite, yet they do not have the usual troostite formation. Troostite does not begin to form in round spots at the grain boundaries in Seminole steel, but seems to have the characteristic of broadening out the grain boundary into a dark line. From this stage the entire grain begins to etch a little more rapidly and take on a darker color, but the ground mass of the grain does not appear to alter in general characteristics as is usually found in the transformation from austenite, martensite, troostite and sorbite, as understood as applying to the usual form of alloy steels or carbon steels.

The New York Chapter of the American Association of Engineers will hold its next meeting, at which officers will be elected for the ensuing year, at the Engineering Societies Building, 29 West Thirty-ninth Street, New York, on May 14.

Republic Iron & Steel Co. Acquires Deforest Sheet & Tinplate Co.

Chairman John A. Topping of the Republic Iron & Steel Co. has announced the acquisition of the Deforest Sheet & Tinplate Co., Niles, Ohio, by the Republic company. The purchase includes the entire capital stock and property of the Niles company, consisting of eight sheet mills and two jobbing mills, with a manufacturing site of 225 acres of land. The statement adds: "The total capacity of the property is 60,000 tons per annum of blue annealed, black and galvanized sheets, together with a line of roofing products. The purchase of this property by the Republic company gives it an entirely new line of business, together with sufficient acreage of desirable manufacturing property to enable it to extend its development along various highly finished lines of iron and steel products."

The Deforest Sheet & Tinplate Co. was organized in 1909. Its outstanding capital stock is $596,800, of $600,000 authorized, and its funded debt is $175,000. The Youngstown correspondent of THE IRON AGE sends the following concerning the transaction just concluded, based chiefly on a statement made there by president Thomas J. Bray of the Republic company:

"By purchasing this property the Republic Iron & Steel Co. engages in a new line of business, its principal finished products heretofore having been iron and steel bars, light structural shapes, pipe, plates, bolts, shafting and railroad spikes. While the Republic company has no definite plans of enlargement or additions at the Deforest plant, it is probable that later on a considerable number of new sheet mills will be built. One of the reasons for purchasing this property was the necessity for acquiring additional space for future development along various highly finished lines, the Republic company's property in Youngstown being fairly well taken up by the extensive building program which has been completed during the past ten years.

"President Charles S. Thomas of the Deforest company states that he will remain with the company for a time and that the organization will remain intact for a while. He was the largest individual owner in the corporation. The Republic company will take possession of the property May 1."

Wolverine Tube Co. Purchased

The Wolverine Tube Co., with plant at 33d Street & McGraw Avenue, Detroit, manufacturer of brass and copper seamless tubes, has been purchased by a group of men who have been prominent in this industry for a long time. H. A. Higgins, former president of the company, who represented all the stockholders in the transaction, says that the business had reached such proportions that the officers who have other interests could not properly handle the company's affairs unless a complete re-organization were effected.

The new owners include Charles C. Limbocker, president, who has represented A. H. Wells & Co., Waterbury, Conn., in the Western territory for the past 10 years; Harry J. Hooks, secretary-treasurer, for the past 14 years Western representative of the United Wire & Supply Co., Providence, R. I., and George R. Anthony, vice-president, who has been general manager of the Detroit plant of the American Radiator Co. William H. Sherman has been made factory manager. Mr. Sherman was connected with the United Wire & Supply Co., Providence, R. I., for 24 years, as general superintendent. The new officers have expressed the intention of carrying out the policies of expansion of the former management, which made several additions to the plant in the past few years.

National Trading Co. Organized

The National Trading Co. has been organized with general offices in room 1302, Swetland Building, Cleveland, branch office in room 516 Oliver Building, Pittsburgh, and later another office will be opened in Philadelphia. The new company will handle a full line of supplies for steel plants and foundries, including pig iron, semi-finished and finished steel, coal and coke, ferroalloys, limestone and refractories. Officials are John A. Kling, Kelly Island Lime & Transport Co., Cleveland, president; Frank H. Ginn, president McMyler-Interstate Co., and also of the Ohio & Pittsburgh Coal Co., vice-president; John R. Foster, sales manager of ingot molds of the Valley Mold & Iron Corporation, Sharpsville, Pa., secretary and treasurer. Mr. Foster will make his headquarters in Cleveland, while the manager of the Pittsburgh office is Harry O. Price, formerly with Walter-Wallingford Co. and Cherry Valley Iron Co. E. G. Motheral, formerly with the American Ship Building Co., will have charge of sales of steel, and Lloyd Bailey will handle sales of coal and coke.

New Mill for Worcester Pressed Steel Co.

The Worcester Pressed Steel Co. is getting figures for the equipment of its proposed hot-rolled strip steel mill, which may or may not be built this season, all depending upon the results of certain negotiations now in progress. The mill will have a capacity of 15,000 tons annually and will require a 12-in. Belgian mill, together with furnaces and gas producer plant. Several buildings will be erected either this year or next, including two structures, 90 x 250 ft. each, and a power house. The company recently purchased 25 acres adjoining its property on the south, which will provide ample room for future development. The cold-rolled steel plant has been in operation for some time, with a capacity of 30,000 tons annually. The company reports a better condition of business, without much real life, to be sure, but with some signs for encouragement. The demand for pressed steel from the manufacturers of pleasure automobiles is improving, but the truck business is not good as it affects the pressed steel industry centering in Worcester. The builders of tractors are contributing to business, however, and much is expected of them in the not distant future.

Service Machine Co. Organized

The Service Machine Co., Elizabeth, N. J., has been incorporated to do a business in machining metal articles or parts, in assembling machinery up to 1000 lb. weight, in designing and constructing machinery and tools, especially those used in fabricating sheet structural work and metal commodities, and in making jigs, gages, special cutters, tools and fixtures and general millwright and machine erecting work. The new company represents a development growing out of the purchase of the business of the Special Machine & Tool Co., and the new incorporation has been made by William F. Burditt, Jr., president, who was for a number of years chief engineer, superintendent and director in a manufacturing concern which earned an enviable reputation in the design and production of machinery; by E. D. Wolfe, who is treasurer and business manager, and George I. Seget, secretary and works manager.

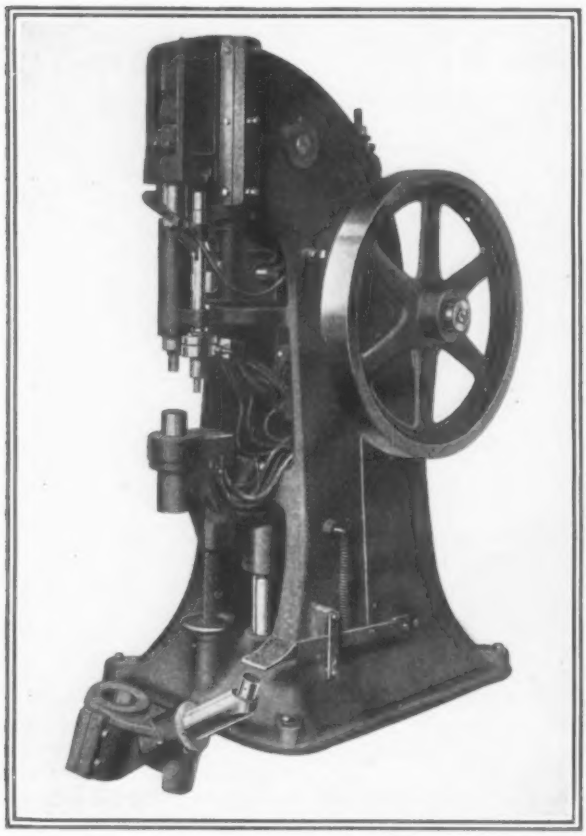
Mansfield Company Expands

The Mansfield Sheet & Tin Plate Co., Mansfield, Ohio, which will enlarge its plant, will install four additional hot mills, four cold mils, together with the necessary furnaces and other equipment. The mill stands will be motor driven. The Hyde Park Foundry & Machine Co., Hyde Park, Pa., will furnish the mills, and the Falk Co., Milwaukee, Wis., the gear drive. The furnaces will be built by the company itself. The Alliance Machine Co., Alliance, Ohio, will furnish two 30-ton cranes. The contract for the building, 400 x 225 ft., will be let in a few days. The company advises that its business has increased to such an extent that the installation of the additional units has been made necessary. With the additional mills the company will have 16 hot mills and 18 stands of cold rolls.

The Republic Iron & Steel Co. has completed plans to enlarge its principal office building on Market Street, Youngstown, Ohio, which houses the executive officers. The building is now six stories. It will be extended 30 ft. in the rear and two more stories added. The top floor, from present plans, will be devoted to a recreation center for employees, with club and lounging rooms.

Electric Riveting Machine

A stationary type of riveter designed to meet the requirements in manufacturing small riveted parts that can be conveniently brought to the machine has been placed on the market by the Thomson Electric Welding Co., Lynn, Mass. Two separate upper dies are used mounted on a sliding head first to utilize a copper electrode in contact with the rivet shank for heating and then a steel die for heading the rivet. The upper copper



This Electric Riveting Machine Employs Two Separate Upper Dies Mounted on a Sliding Head. One die is used for heating and the other for heading the rivet

die and the lower steel die-holder which is of cast copper are water-cooled.

The clutch which engages the press mechanism with the belt-driven flywheel automatically disengages itself after having made its down stroke, regardless of whether the foot-treadle is still depressed or not. Another feature incorporated also prevents the power-press from acting unless the steel die is in proper position regardless of any action of the operator.

The machine illustrated is known as the company's type C and will handle commercial lengths of rivets with shanks from ⅜-in. in diameter to ¾-in. in diameter. It is claimed to be particularly adapted for riveting structural-steel sections for bridge and building construction, automobile parts, such as differential-gear assemblies, rear axle housings, frames, etc.; setting heads into small steel tanks where the heads bell in toward the interior; assembling heavy boxes as used on locomotives, cars, etc.; also for riveting a rod through a wooden handle or spool.

The manufacturer states that the actual heating time on a ¾-in. rivet through two ½-in. plates is 15 seconds.

The Bessemer Gas Engine Co., Grove City, Pa., for some years manufacturer of gas engines, is now putting on the market a Diesel type of oil engine for which the company has taken out patents. It is stated this engine will handle without alterations fuels from the highest grade gasoline down to the lowest grade fuel oil, including all grades of kerosene and distillates and most grades of fuel oil. It also will operate on alcohol, benzol and similar hydrocarbons.

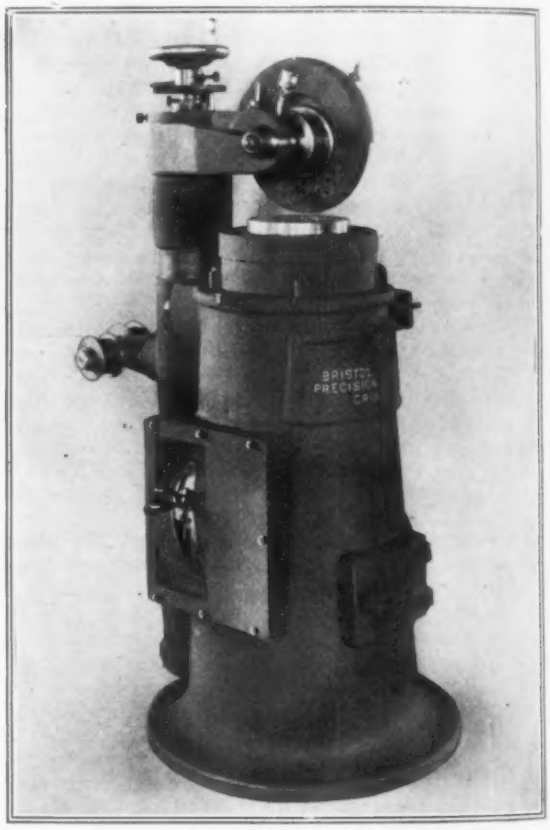
An 8-In. Ring Grinder

A new type of grinder with rotating magnetic chuck, designed for accurate and rapid grinding of flat surfaces of various sizes and shapes, either singly on in multiples, has been added to its line of grinders by the Bristol Machine Tool Co., Bristol, Conn.

The wheel spindle is mounted on a movable head attached to a rigid column which is supported in a long housing on the back of the frame. The lower portion of the head, by a telescopic action, wholly encloses and protects all bearing surfaces of the column from entry of grit or dirt, thus to eliminate guards or other auxiliary methods of protection.

The back column, though rigidly attached to the frame for flat surface work, is provided with angular swivel adjustment with a range up to 4 deg., which makes the machine desirable for the grinding of concave or convex surfaces, particularly on circular saws and milling cutters.

The machines are made in several types and sizes and are regularly equipped with 8, 12 and 16-in. magnetic chucks. They are made for either dry or wet grinding, can be furnished belt or motor driven, and can be used with face plates, chucks, or other suitable



This 8-In. Rotary Grinder Is Particularly Adapted for the Rapid Production of Piston Rings

fixtures for holding work, in place of the magnetic chuck.

The manufacturer states that the machines will grind accurately to within 0.00025 in.

Controlling Current for Electric Furnaces

An invention relating particularly to the method and means of controlling and supplying the current, and preventing excessive surges in the fluctuations of the current and interruption of the arc during the melting-down period in electric steel furnaces, is covered by a patent (U. S. 1,278,635) issued to James H. Gray, United States Steel Corporation, New York. The method consists in supplying a current of comparatively high electromotive force to the electrodes during the melting-down period to produce a comparatively long arc, and cutting a reactance into the primary circuit to insure continuity of the arc thereby, and prevent surges in the power line.

BRITISH EMBARGO LIFTED

Machine Tools and Many Metal Goods Now Admitted Without Restrictions

WASHINGTON, April 29.—Consul General Skinner has cabled that the British Government has removed the embargo against imports from the following important items: Belt hooks for machinery and sewing machines, bolts and nuts, enameled steel tanks with glass linings, heddle steel strip iron, hook strip, tube strip, and ground flat steel stock; machine tools and parts, tools and appliances and parts, namely, abrasive wheels, adjustable clamps, anvils, auger bits, bench drills, bolt clippers, boring heads, calipers, carpenters' tools, chasers, chucks, cooper tools, cutting nippers, dial gages, dies and die stocks, die heads, drills, drill presses, drill sleeves and sockets, emery wheel dressers, engineers' hammers, expanding mandrels, expansion bits, farriers' tools, furniture and dovetail bits, gaged glass cutters, hacksaw blades, hand and breast drills, hand grinders, hand screwing machines, hide hammers, iron hammer heads, joiners' tools, lathe carriers, lathe dogs, lead hammers, machine vises, masons' tools, measuring tapes and rules (except wooden rules) and including verniers, micrometers, milling cutters, miter blocks and scrapers, blocks and scrapers for metal miter boxes, nail pullers, pipe cutters, pipe vises, pipe wrenches, pliers, polishing heads, punches, reamers; saws—band, circular, crosscut, kitchen and others; screwing tackle (i.e. chasers, dies and stocks, taps, and threadmilling cutters); shipwrights' tools, slide rules of metal, smiths' tools, spanners, swage shapers, tailors' shears and trimmers, 6 in. or more in length, tapping attachments, taps, tap wrenches, tool holders, trench struts, tube expanders, upholsterers or household hammers, welt plows, deacon's wood boring bits, woodscrapers, treadle lathes of 3-in. centers and over, wire hooks (other than coat and hat hooks), woodworking machinery and parts thereof. Solid drawn weldless tubing is to be admitted only in very special circumstances.

Manganese Ore Imports Still Heavy

Manganese ore imports in March were heavy, having been 48,238 gross tons, as compared with 19,300 tons in March, 1918. The imports in January and February were 47,504 tons and 19,579 tons respectively, making the total for the first quarter 115,321 tons, as against 118,536 tons for the first quarter of 1918. For the nine months ended March 31, 1919, the total imports have been 135,352 tons, as contrasted with 162,135 tons for the same period in 1918.

Larger Ferromanganese Imports

Ferromanganese imports in March, 1919, were 5741 tons, as contrasted with 3555 gross tons in March, 1918. The January and February imports this year were 850 tons and 2620 tons respectively, making the total for the first quarter of this year 9211 tons, as against 6022 tons for the first quarter a year ago. The total imports for the nine months ended March 31, 1919, have been 17,905 tons, and for the same nine months ended March 31, 1918, they were 20,807 tons.

The Stroh Steel Hardening Process Co. announces the removal of its general offices from 1209 First National Bank Building to Suites 800-806 and 819 Westinghouse Building, Pittsburgh.

The E. B. Hayes Machinery Corporation, Oshkosh, Wis., is planning to double the size of its plant and make a very considerable increase in equipment.

Power Piping Co. announces that after May 1 its general offices will be located at the works, Beaver Avenue, at Western Avenue, Pittsburgh.

The Fischer & Hayes Rope Co. is changing its name to the Fischer & Hayes Rope & Steel Co. and is now located at 741-745 West Van Buren Street, Chicago.

STEEL CORPORATION EARNINGS

Extra Dividend on Common Omitted—Steady Declines Continue

The United States Steel Corporation's report for the first quarter of the year 1919 shows net earnings of $33,513,384 after deductions for Federal income and war excess profits taxes, but the financial statement does not give the amount of the allowance for taxes. Previous allowances were $50,000,000 in the last quarter of 1918; $101,987,347 in the third quarter, $90,716,250 in the second quarter and $31,585,198 in the first quarter. The steady decline in earnings which characterized the third and fourth quarters of last year continued this year, the net earnings for March being only $9,390,190.

The regular quarterly dividends of 1¾ per cent on the preferred stock and 1¼ per cent on the common were declared, but the extra dividend on the common was omitted, after declaring dividends for each quarter of the past two years. The extra dividend on common was reduced to 1 per cent for the last quarter of last year as compared with 2 per cent in the third quarter and 3 per cent for each of the six preceding quarters. The dividend declarations for 1918 on the common amounted to 14 per cent and in 1917 to 17 per cent. The net earnings for the past three years by quarters and for the first quarter of this year have been as follows:

Statement of United States Steel Corporation and Subsidiary Companies for the quarter ending March 31, 1919

EARNINGS

	Earnings before charging interest on the subsidiary cos.'s bonds outstanding	Less: Interest on the subsidiary cos.' bonds outstanding	Balance of earnings
January, 1919	$12,978,673	$738,506	$12,240,167
February, 1919	12,621,476	738,449	11,883,027
March, 1919	10,129,178	738,988	9,390,190
	$35,729,327	$2,215,943	

Total earnings after deducting all expenses incident to operations, comprising those for ordinary repairs and maintenance of plants, allowances for estimated proportion of extraordinary cost, resulting from war requirements and conditions, of facilities installed and of inventories of materials on hand, also estimated taxes (including Federal income and war excess profits taxes), and interest on bonds of the subsidiary companies		$33,513,384
Less charges and allowances for depreciation, applied as follows, viz.:		
To depreciation and extraordinary replacement funds and sinking funds on bonds of subsidiary companies	$8,707,368	
To sinking funds on U. S. Steel Corporation bonds	1,931,587	
		10,638,955
Net income		$22,874,429
Deduct: Interest for the quarter on U. S. Steel Corporation bonds outstanding	$5,177,798	
Premium on bonds redeemed	215,615	
		5,393,413
Balance		$17,481,016
Dividends on stocks of the United States Steel Corporation, viz.:		
Preferred, 1¾ per cent	$6,304,919	
Common, 1¼ per cent	6,353,781	
		12,658,700
Balance of surplus for the quarter		$4,822,316

UNFILLED ORDERS ON HAND

March 31, 1919 ..... 5,430,572 tons

Quarters	1919	1918	1917	1916
First	$33,513,384	$56,961,424	$113,121,018	$60,713,624
Second		62,557,391	90,579,204	81,126,048
Third		42,961,589	68,243,784	85,817,067
Fourth		36,354,165	59,724,125	105,968,347

The Wayne Iron & Steel Co., which is building a plant in New York State for the manufacture of high-speed tool steels and alloy steels for automobile parts, airplane parts and other purposes, has opened an office at 404-406 Park Building, Pittsburgh. The company expects to have its plant completed in the early summer. It has already had several thousand pounds of steel made under its own process, with satisfactory results.

ESTABLISHED 1855

THE IRON AGE

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Metal Trades and the New Labor Era

Attendants for many years at conventions of the National Metal Trades Association could not miss the new note on industrial relations which was repeatedly struck at the sessions held in New York last week. There was far less of the spirit of antagonism that has marked the association's discussions of labor questions in previous years. Granted that the lawless acts of organized labor, the breaking of contracts by unions, and the limitation of output and opposition to bonus and other systems designed to increase production and the rewards of capable workers, were the provoking causes of the militant expressions of the past, and that such resentment was natural and justifiable, the fact remains that the spirit of this year's convention was noticeably conciliatory. The president's address definitely indicated that the association is keenly alive to the tendencies which are currently described as fruits of "industrial democracy," and repeatedly manufacturers who took part in the proceedings emphasized the necessity of establishing closer relations between employers and employees.

"We must look at our workmen in a new way," was one member's view of the changed conditions. As another put it, "the industrial tendency of the times is to think more of the other fellow." An officer of the association, referring to the eight-hour day and to proposals for a larger voice of employees in deciding working conditions said: "While we may or may not agree with the practicability or wisdom of these plans or be in sympathy with them, we must admit the fact that they are forcing themselves to the front and demanding our attention, if not our decisions." Some members of the association have already set in operation plans for employee representation in shop government, and one of these plans was described in detail on the convention floor. The employer who may have declared on other occasions his intention to run his own business in his own way listened without protest to speakers who announced that autocracy in business like autocracy in government is dead and buried and that industry must no longer be looked on as a matter of private concern. Instead of uncompromising opposition to the eight-hour day, the association's attitude now is that the working day is a matter for local determination; that an eight-hour day in New York and Chicago may be the equivalent of a nine-hour day in a small community.

On the principle of the open shop, the National Metal Trades Association has not changed its historic attitude. That position is strongly reinforced by the large number of plants in which the highest wages and the best working conditions have been attained without the intervention of walking delegate or union mandate.

The 1919 convention will go down as one which recognized the new era in the relations of metal trades workers and employers and the obligations imposed by the changed conditions. That the new régime brings difficult problems there is no doubt—problems whose solution will call for a much larger supply of good will than has generally been brought to the settlement of so-called labor troubles. But concession and conciliation must begin with employers, and there is high promise in the definite recognition of that fact by the National Metal Trades Association.

Mr. Hurley's Broad Views

Edward N. Hurley, chairman of the United States Shipping Board, delivered an address last Friday before the Foreign Trade Convention at Chicago, remarkable for the numerous points touched upon, each worthy of emphasis and extended treatment. What is most striking is Mr. Hurley's plain statement of beliefs that run counter to much that has been said in the United States by those who have not had the unusual opportunities for observing conditions both abroad and at home that have fallen to Mr. Hurley's lot in the past few months. For example, Mr. Hurley says:

> We hear a great deal these days about what is going to happen to American business when Great Britain and the other nations, supposed to have certain advantages over us, get into full swing. We have heard such doleful predictions many times before the war.
>
> After three months of studying the situation in Europe I have not observed any outstanding advantage which they have over us, either from a production point of view or a labor point of view or from the character of products manufactured. This is true not merely of manufacturing, but with reference even to shipbuilding. Here we find some cloistered critics asserting we will never be able to compete with British

shipping. Over in England you will hear the English critics telling their government that Great Britain will never be able to compete with us.

Later in his address Mr. Hurley referred to "dumping," insisting that foreign goods should not be permitted to be dumped in our market at ruinous prices, nor should our business men employ similar methods in foreign markets.

As to Bolshevism, Mr. Hurley, who has had excellent opportunities for observation both here and abroad, insists that the American workman will be protected against it because he has the saving grace of this nation, common sense. As to wages, he says: "The American wage scale is right, because it represents American efficiency and skill. So long as the American workman gives his best effort, he is fully entitled to the higher wages he receives."

When Mr. Hurley went abroad, his object was in part to seek uniform operating conditions for the merchant marines of the world. There was natural skepticism as to the success of any plan which involved persuading British ship owners to come up to American costs of operation. While Mr. Hurley does not speak definitely of results on this main objective of his mission, he takes no discouraging view of the outlook when he says: "We have not worked in the dark in evolving a plan for the American merchant marine. We know what profit there is in operating ships, and what profit is possible in building ships. We have the benefit of study made abroad, as well as at home, and we have the benefit of official records of cost of operation and of construction. Those who advocate any operating plan not based upon such official information are apt to make costly mistakes."

As to the necessity of our buying goods abroad, a consideration so often neglected, Mr. Hurley has some plain words. He insists "we must purchase raw materials and manufactured products from foreign countries as well as sell to them." Ships are returning from abroad in ballast, when they should be bringing goods, such a movement being helpful in balancing our trade. Mr. Hurley might have cited statistics, the figures for the first three months of this year showing that our favorable balance in merchandise trade ran at the rate of $4,400,000,000 a year, a pace that the rest of the world obviously cannot stand for any length of time.

Our Rail Output

The production of rails last year in the United States was 2,533,675 gross tons. Since 1900 production was smaller in only four years—1904, 1908, 1914 and 1915—three of which were distinctly "off" years for all steel products. It does not follow, however, that the rail production last year was extremely light for the conditions existing. Rails, like tin plate, are in a class by themselves, and the output does not reflect steel trade conditions generally.

Illustrative of this fact, in 1887 there was produced 2,139,640 tons of iron and steel rails, and until 1899, 12 years later, that tonnage was not again reached. In 1906 there was produced 3,977,887 tons of rails, and in none of the 12 years since has that tonnage been touched again. In 1887 three tons of pig iron were produced to one ton of rails; in 1906, six tons; in 1918, 15 tons.

These apparent anomalies in rail tonnage are readily explained. At first the country was engaged simply in building railroads. Long stretches of track were required to reach objectives, and traffic over the rails once laid was light and the rails did not wear out rapidly. The heaviest railroad building occurred in 1887, when 12,000 miles of new road was constructed. Then there was a period of quiescence.

About 1899 the steel car made its advent in numbers, heavier than the wooden car and carrying a much greater burden. At the same time the weight of locomotives increased quite sharply. The result was rapid destruction of the relatively light rails in track. Replacement requirements became heavy, and, aided by easy money, the railroads bought rails very freely both for replacement and for new track, particularly in 1905, 1906 and 1907, in which years rail production averaged 3,663,000 tons a year, far in excess of any rate before or since.

While a large tonnage of rails went out of the country in 1918, but a small tonnage was used for laying new track at home, and thus the supply of rails for replacement purposes was not restricted as much as might be inferred from the apparently light production. It is a notorious fact that the track of the country is in condition far below normal, but to restore it to good condition labor is probably needed to a much greater extent than any large quantity of new rails.

Rail exports in 1918 are reported at 453,944 tons, of which 172,331 tons are listed as going to France, while an unknown amount for the American operations in France went in Government owned or Government chartered vessels, whose cargoes do not enter the official export statistics. Inasmuch as only 20,834 tons of girder and high T rails was produced, the total rail consumption by electric lines was not very large. The *Railway Age* statistics show 1538 miles of main line track laid in 1918, which, with an allowance for yard track and siding, would account for not over 250,000 tons of rails. Making the deductions for exports, for light rails, etc., the rails available to the steam roads for replacement purposes must have amounted to 1,300,000 or 1,400,000 tons, which can hardly be regarded as much short of the requirements.

The extreme scarcity of open-hearth steel in 1918 did not cause any spurt in the production of Bessemer rails, the output being 494,193 tons, or less than one-fifth the total rail production. In 1907, or 11 years earlier, open-hearth rails were only one-fourteenth the total, while in the next year they made up more than one-fourth the total. Thus the swing from Bessemer to open-hearth was quite rapid.

The production of light rails, in 1918, under 50 lb., 387,907 tons, broke all records. Doubtless this performance was due to heavy requirements for narrow gage track in France.

The 100-pound rail first received attention about 1897, when the Carnegie Steel Co. rebuilt the Pittsburgh, Shenango & Lake Erie Railroad, making it the Bessemer ore route, and for several years thereafter the 100-pound rail did not have much vogue.

Beginning with 1914, separate statistics have been compiled showing the production of sections of 100 pounds and over, the output ranging from 528,703 tons in 1914 to 766,851 tons in 1916, while the 1918 output was 592,462 tons. Assuming that the last named tonnage averaged 110 pounds per yard, it sufficed to lay no less than 3420 miles of track. As nothing but pressing work could have been done last year, the showing as to the popularity of the very heavy rail is impressive. The rail mills are at last winning their contention that this is the rail to use when there is heavy duty.

First-Aid Equipment Compulsory

A law has been passed in Massachusetts providing that on May 1 all plants employing 100 or more employees shall have an emergency room for the first-aid treatment of persons taken ill or suffering injury on the premises of the employer. Presumably the authors of the statute expect that some means will be adopted also by employers to equip the emergency room for active service. But not all plants employ persons who have the necessary training to give first aid in a competent manner, and the question of employing a skilled nurse or other assistant will be determined by the demand arising for such services. The Massachusetts act directs attention anew to the educational possibilities of the Red Cross movement in peace times on the lines so well followed by the St. John's Ambulance Association in Great Britain. This association trains at a nominal cost employees specially selected for the service, so that in the interval before a surgeon arrives they can give intelligent assistance in cases of accident.

Recognizing the importance of this situation, the Red Cross chapter at Worcester, Mass., has offered to train a number of workers from each of the plants in that district having 100 or more employees. The plan contemplates the training of one or two persons from each of 170 plants, and certificates will be issued to those passing the examination at the close of the ten lessons, representing a total of fifteen hours' instruction. Doubtless the Worcester idea will appeal to other industrial communities, for the emergency room is rapidly coming to be an institution, apart from any statutory regulation on the subject.

Good Spirit of Employees

In these days of world-wide turmoil, when radical labor agitators are having such baneful influence on large numbers of working men, it is pleasant to be able to record any evidence of real progress in establishing more satisfactory relations of employers and employees. Such evidence has been furnished by the success of the representative plan adopted by the Standard Oil Co. of New Jersey. The fact that 119 matters, any one of which might have caused serious controversy, were discussed and settled amicably, is important, and even more significant is the action taken recently by the employees of the can shop, wholly on their own initiative, whereby 1100 men proposed to increase their efficiency more than 10 per cent. The men adopted resolutions declaring that in appreciation of what the company had done they wished to reciprocate. The preambles and resolutions are as follows:

Whereas, Up to the present time a day's work for top and bottom cutters has been 27 boxes of tin each, be it

Resolved, That from this date, as a voluntary act on the part of top and bottom cutters, they agree to cut 30 boxes each per day.

Whereas, Most of the other employees of this can shop are working on machines that are already running to the limit of their capacity, be it

Resolved, That they voluntarily agree to use more care in performance of their tasks, in order to make their work as near 100 per cent efficient as possible.

The friendly spirit of these employees will doubtless result in calling the attention of manufacturers throughout the country to the Standard Oil Co.'s representative plan to an increasing extent. While the company has taken many other steps to help its men, such as group insurance, a special campaign against tuberculosis, and taking back into its employ former employees who were in the military or naval service, the carrying out of the representative plan promises more far reaching benefit than any other measure that has been adopted.

American Maritime Policy

The business of the country is indebted to the leaders in the National Foreign Trade Council for their labors in season and out of season in the forming of opinion on national measures for the furtherance of export trade. If at times conventions like that of last week at Chicago seem long on talk, those best able to measure their practical outcome are in no doubt as to their definite and permanent contributions to overseas trade extension. One of the best services of these conventions has been in the making of sentiment on the vexed question of American merchant ships and their profitable operation in competition with the carriers of Great Britain. It is interesting to note that the well-worn arguments for subsidies were absent from the papers read at Chicago, and that the future of the great fleet that has been built with public money and the other problems created by the war have forced a recasting of the whole discussion on the American merchant marine.

Chairman Farrell, of the Foreign Trade Council, to whom more than to any other individual the country is indebted for the place American steel holds to-day in world markets, has been in like manner conspicuous in the effort to think through the intricacies of the ship problem. In his Chicago address he indorsed in the main the Hurley plan for private rather than public operation of American ships, "as dictated equally by business sense and equity and in the public interest." In view of the steady advance in wages in Great Britain he is not as much concerned as heretofore over high-priced American labor in ship operation, but points to other considerations that have an important bearing on the competitive situation:

If in other respects we are able to meet the competition of the world on equal terms, especially with types of ships built or to be built comparable with those of our competitors, experienced in long voyage trades, the relatively high wages of American officers, engineers

and seamen sufficient in numbers to operate economically with safety will not prove to be a serious handicap. Of course it is essential that laws requiring the employment of an excessive number of seamen or engineers, be repealed by the establishment of a definite policy.

One of the earliest requirements of the shipping situation is likely to be a general international agreement about the employment of the agencies of ocean transportation in the least wasteful and the most effective way.

The freedom of the seas, as a working formula of peaceful intercourse, should find a larger conception. It should stand for open ports and as free an interchange of commodities as the fiscal necessities of the nations will allow. To ourselves, with a merchant marine commensurate with the resources of our country, the lesson will come with new force, that to sell we must also buy.

The emphasis put in the concluding sentence on the necessity of revising some long-cherished tenets concerning imports is in line with other recent evidences of the new thought of American manufacturers on the national policies of the future. A great merchant marine and our great credit balances with European nations have stripped the prospect of expanding imports of much of its old-time terror.

Tribute to Barry H. Jones

Barry H. Jones, secretary and a director of the Bethlehem Steel Corporation, who died on April 3, was paid a high tribute at a recent meeting of the directors of the corporation. In the minute adopted by the board successive promotions of Mr. Jones are indicated and his strong traits of character are recognized in fitting terms. His career so well exemplifies the possibilities of advancement in American industry that we quote the following from the tribute of the Bethlehem directors: "Mr. Jones was suddenly stricken while in the midst of his work in the afternoon of April 3, 1919, and died a few minutes later. Although he was cut off in the prime of life—lacking six days of being 45 years old—he was in years of service one of the oldest of 'the Bethlehem Boys.' He graduated from Lehigh University in 1894 with high honors as bachelor of science in metallurgy. The following year he acted as instructor at Lehigh and at the same time did post-graduate work for which he received the degree of engineer of mines. He entered the employ of the Bethlehem Steel Co. at about the time of its organization in 1899, as superintendent of boilers. Because of efficiency shown in some statistical work to which he was assigned shortly thereafter, he was given a prominent position in the accounting department. Here he showed great ability and rapid development in accounting and financial matters, with the result that he was made comptroller and auditor on April 1, 1902, which offices he held until June 27, 1906, when he was elected a director and secretary and treasurer of the company. He continued as director and secretary of the company until his death, having resigned as treasurer on Oct. 16, 1917. Mr. Jones's official connection with the Bethlehem Steel Corporation dates almost from the time of its organization. He became comptroller and auditor on Jan. 19, 1905, and held those offices until he was elected assistant treasurer and assistant secretary on July 17, 1906. Within less than two months thereafter, on Sept. 4, 1906, he was elected treasurer and secretary. The latter office he held continuously until his death, having resigned as treasurer on Oct. 15, 1917. He became a director of this corporation on April 4, 1911, which office, with the exception of a very brief interval, he continued to hold until his death."

The National Association of Purchasing Agents announces that its annual convention will be held Sept. 22, 23 and 24 at the Hotel Bellevue-Stratford, Philadelphia.

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Iron and Steel Markets

SLIGHTLY BETTER DEMAND

Railroad Administration and Steel Makers May Confer

Some Increase in Export Demand as Well as in Domestic Business

Business in several finished steel lines has taken a start in the past week, but it would be easy to exaggerate the amount of it, the comparison being with several weeks in which buyers simply looked on and waited for Washington to show the way. Producers see little indication of good business in the next two months, and in some quarters no considerable improvement is expected short of the fall months.

Further note-writing between the Industrial Board and the Railroad Administration has ended in the latter's acceptance of the board's suggestion that the Railroad Administration and the steel producers' committee confer on prices for railroad material. The steel committee considered the matter Tuesday but its action was not made public. It is a fair presumption that if the Railroad Administration asks the steel committee to meet it in conference at Washington the steel men will go.

In the trade at large the feeling is one of disappointment that the country is not told in some decisive way that the Government has taken its hands off the steel business. Concerning railroad buying, the Railroad Administration announces that it is not delaying purchases to force down steel prices, but is using a surplus of material piled up during the war. This confirms the belief of steel producers that only moderate buying is to be expected in any event.

The slight improvement in demand has not meant immediately better employment at mills. On the contrary, the scale of operations is somewhat less than in the preceding week. In the Chicago district the average is about 60 per cent, at Pittsburgh and Youngstown 45 to 50 per cent and in Eastern Pennsylvania about 40 per cent. There is more disposition to believe that the readjustments in the industry will extend to wages.

While finished materials are generally sold at the prices announced on March 20 there are more indications of slight concessions in pig iron. The furnace basis of $26.75 for foundry iron is not maintained in the South, and there are variations here and there in other districts. The largest sale reported is of 3200 tons of foundry and malleable in the Cleveland district. Cincinnati reports a 1000-ton transaction in malleable and 1000 tons of foundry iron is pending there—tonnages that in an ordinary market would not call for mention.

A new export freight rate of 55c. per 100 lb. on pig iron from Pittsburgh to the Pacific Coast has been made by the Railroad Administration. The recent rate was 75c., but it is still possible to ship to the Far East by way of Eastern ports at about $2 per ton less than by Pittsburgh and San Francisco. The new export rate on finished material from Pittsburgh to the Pacific Coast is 60c. per 100 lb., a reduction of 25c.

Increased activity in structural steel is indicated in awards of 11,000 tons for two buildings in Chicago; of 6000 tons for the Mare Island Navy Yard; of about 3500 tons of plates and shapes for Mexico; of 1600 tons for a Hartford office building and 1500 tons for transportation lines in Philadelphia. Fabricators on some of this work have been guaranteed a reduction in price should such occur prior to the shipment of the material.

Japan is inquiring for 10,000 tons of 70 lb. rails. For shipment to France orders have been placed for 200 tank and 200 flat cars.

Pipe business has accumulated until on lap weld sizes the mills are filled up for 60 days or more. Several sizeable pipe lines are now under negotiation and a volume of inquiries for oil tanks is expected.

Specifications and new business in wire products are heavier than in some time.

Cutting in steel bars, $2 per ton, is still noted, but reductions in some forms of semi-finished steel have not resulted in business.

On a large export inquiry for railroad equipment a sharp concession resulted in only a fraction of the business being placed. Seeing that the cut was no stimulus to buying, the price was promptly raised. A request for prices by the Railroad Administration on 15,000 to 20,000 kegs of spikes is regarded as merely a feeler.

In spite of steadily declining steel output, manganese ore imports continue on a large scale now that the domestic industry has shrunk from its war proportions. In March the imports were 48,000 gross tons, making the first quarter movement 115,000 tons. This compares with 118,500 tons for the first quarter of 1918.

The British Government has lifted the embargo in effect against machine tools, hardware, small tools and many other metal products.

Pittsburgh

PITTSBURGH, April 29—(*By Wire*).

If another conference is held in Washington over prices it is not believed that the steel producers will attend it. A meeting over railroad purchases would be different. Consumers of steel do not regard these conferences at Washington with favor, and are strong in the belief that Jan. 1, when the War Industries Board went out of existence and the Government gave up control of prices, was the time an open market should have been declared, and prices of steel and labor regulated entirely by the old law of supply and demand. It is pointed out that prices that have a label on them, reading official or Government or whatever the term may be, are distasteful to buyers.

Reports made by selling departments of the various steel companies in the last several days as to conditions are more encouraging than they have been for some time. The volume of new business received in the past week against specifications was larger than for some time, but this may be only a flash in the pan and is not regarded at all as indicative of a larger buying movement. Consumers made up their minds some time ago

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Apr. 29, 1919	Apr. 22, 1919	Apr. 1, 1919	Apr. 30, 1918
No. 2 X, Philadelphia‡	$31.90	$31.90	$31.90	$34.25
No. 2, Valley furnace†	26.75	26.75	26.75	33.00
No. 2, Southern, Cincin†	30.35	30.35	30.35	35.90
No. 2, Birmingham, Ala†	26.75	26.75	26.75	33.00
No. 2, furnace, Chicago*	26.75	26.75	25.75	33.00
Basic, deliv., eastern Pa.	29.65	29.65	29.65	32.75
Basic, Valley furnace	25.75	25.75	25.75	32.00
Bessemer, Pittsburgh	29.35	29.35	29.35	36.15
Malleable, Chicago*	27.25	27.25	27.25	33.50
Malleable, Valley	27.25	27.25	27.25	33.50
Gray forge, Pittsburgh	27.15	27.15	27.15	32.75
L. S. charcoal, Chicago	38.85	38.85	38.85	37.50
Rails, Billets, Etc.,				
Per Gross Ton:				
Bess. rails, heavy, at mill	45.00	45.00	45.00	55.00
O.-h. rails, heavy, at mill	47.00	47.00	47.00	57.00
Bess. billets, Pittsburgh	38.50	38.50	38.50	47.50
O.-h. billets, Pittsburgh	38.50	38.50	38.50	47.50
O.-h. sheet bars, P'gh	42.00	42.00	42.00	51.00
Forging billets, base, P'gh.	51.00	51.00	51.00	60.00
O.-h. billets, Phila	42.50	42.50	42.50	50.50
Wire rods, Pittsburgh	52.00	52.00	52.00	57.00
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia	2.595	2.595	2.595	3.685
Iron bars, Pittsburgh	2.35	2.35	2.35	3.50
Iron bars, Chicago	2.50	2.50	2.50	3.50
Steel bars, Pittsburgh	2.35	2.35	2.35	2.90
Steel bars, New York	2.62	2.62	2.62	3.095
Tank plates, Pittsburgh	2.65	2.65	2.65	3.25
Tank plates, New York	2.92	2.92	2.92	3.445
Beams, etc., Pittsburgh	2.45	2.45	2.45	3.00
Beams, etc., New York	2.72	2.72	2.72	3.195
Sheip, grooved steel, P'gh.	2.45	2.45	2.45	2.90
Sheip, sheared steel, P'gh	2.65	2.65	2.65	3.25
Steel hoops, Pittsburgh	3.05	3.05	3.05	3.50

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.
†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Apr. 29, 1919 Cents	Apr. 22, 1919 Cents	Apr. 1, 1919 Cents	Apr. 30, 1918 Cents
Sheets, black, No. 28, P'gh.	4.35	4.35	4.35	5.00
Sheets, galv., No. 28, P'gh.	5.70	5.70	5.70	6.25
Wire nails, Pittsburgh	3.25	3.25	3.25	3.50
Cut nails, Pittsburgh	4.25	4.25	4.45	4.00
Fence wire, base, P'gh	3.00	3.00	3.00	3.25
Barb wire, galv., P'gh	4.10	4.10	4.10	4.35
Old Material,				
Per Gross Ton:				
Carwheels, Chicago	$21.00	$21.00	$21.00	$29.00
Carwheels, Philadelphia	22.00	23.00	24.00	29.00
Heavy steel scrap, P'gh	15.00	15.00	16.00	28.50
Heavy steel scrap, Phila	15.00	15.00	16.00	29.00
Heavy steel scrap, Ch'go	15.75	15.75	16.50	28.50
No. 1 cast, Pittsburgh	18.00	18.00	20.00	28.50
No. 1 cast, Philadelphia	22.00	22.00	22.00	29.00
No. 1 cast, Ch'go, net ton	20.00	20.00	22.00	27.00
No. 1 RR. wrot., Phila	21.00	21.00	22.00	34.00
No. 1 RR. wrot., Ch'go, net	15.50	15.50	16.00	29.75
Coke, Connellsville,				
Per Net Ton at Oven:				
Furnace coke, prompt	3.50	3.50	4.00	6.00
Furnace coke, future	4.00	4.00	4.50	6.00
Foundry coke, prompt	4.00	4.00	5.00	7.00
Foundry coke, future	4.50	4.50	5.50	7.00
Metals,				
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York	15.50	15.50	15.62½	23.50
Electrolytic copper, N. Y.	15.25	15.25	15.37½	23.50
Spelter, St. Louis	6.62½	6.65	6.20	6.75
Spelter, New York	6.37½	6.40	6.55	7.00
Lead, St. Louis	4.95	4.95	5.00	6.62½
Lead, New York	4.70	4.70	5.25	6.85
Tin, New York	72.50	72.50	72.50	95.00
Antimony (Asiatic), N. Y.	6.62½	6.50	6.25	13.00
Tin plate, 100-lb. box, P'gh.	$7.00	$7.00	$7.00	$7.75

to buy only such quantities of steel as they absolutely must have and none is disposed to anticipate future needs. Specifications last week for wire and wire nails, sheets and tin plate and some other products were fairly heavy. There is no increase in operations among blast furnaces or steel works, but rather a decrease. Blast furnaces are steadily blowing out, and steel works operations are on a 50 to 60 per cent basis.

Prices are holding up fairly well, but there is some shading, and in a few cases it has been serious. However, sellers are not yet showing a disposition to cut prices very freely to secure business, but there is more inclination to do this as time goes on and the amount of business on the books of the mills grows less. The general opinion in steel circles here is that the summer months will be very quiet, but a revival in steel demand is confidently looked for to come in October, if not before.

Pig Iron.—We can note a sale of 500 tons of standard Bessemer iron at the full price of $27.95 at Valley furnace and also a sale of 250 tons of high silicon Bessemer iron at $26 at Valley furnace. However, the market is practically bare of new inquiry, and blast furnaces are steadily going out. The Carnegie Steel Co. has put out Neville Island. The Shenango Furnace Co. has banked one stack, and is not making a pound of iron, all three of its furnaces at Sharpsville being idle. Alice furnace at Sharpsville, whose product has been taken for some time by the Shenango company, will blow out shortly after May 1, and the furnace will revert again to the Valley Mold & Iron Corporation at Sharpsville, which owns it. There is some inquiry for small lots of foundry iron ranging from 50 up to 200 tons for prompt shipment, and prices on foundry iron, even on these small sales, have lately been shaded $1 per ton or more. Output of pig iron in April in the Pittsburgh district will be much the smallest in a long time. We quote:

Basic pig iron, $25.75; Bessemer, $27.95; gray forge, $25.75; No. 2 foundry, $26.75; No. 3 foundry, $26.25; and malleable, $27.25; all per gross ton at Valley furnaces, the freight rate for delivery in the Cleveland and Pittsburgh districts being $1.40 per ton.

Ferroalloys.—There is very little new demand and any ferroalloys being sold are resale material, which goes at lower prices than the manufacturers quote. Nearly all consumers are heavily stocked and are trying to reduce their stocks by offering mateial at relatively low prices. There would be no trouble in buying 80 per cent ferromanganese at $110 or less, delivered, but the price of the manufacturers of ferromanganese is $150 at furnace. It will take some time to work off the present heavy stocks, and prices may recede further.

We quote 78 to 82 per cent resale ferromanganese at $110 to $115, delivered, with a reduction of about $2 per unit for lower percentages. We quote resale 50 per cent ferrosilicon at $90 to $95 and resale 18 to 22 per cent spiegeleisen at $35, delivered. Prices on Bessemer ferrosilicon are: 9 per cent, $43; 10 per cent, $45; 11 per cent, $48; 12 per cent, $51. We quote 6 per cent silvery iron, $36.75; 7 per cent, $37.75; 8 per cent, $40.25; 9 per cent, $42.25, and 10 per cent, $44.75, but some sellers not in Jackson County have been quoting on a basis of $35 for 6 per cent. About $3 per gross ton advance is charged for each 1 per cent silicon for 11 per cent and over. All the above prices are f.o.b. maker's furnace, Jackson or New Straitsville, Ohio, which have a uniform freight rate of $2.90 per gross ton for delivery in the Pittsburgh district.

Billets and Sheet Bars.—Conditions in steel trade are very quiet, and there is no new demand for semi-finished steel in the shape of billets or sheet bars. Steel mills in the Youngstown district are operating only to 50 per cent or less, with the outlook for a still lower rate of operation in the near future. There have been offers of steel at less than the prices supposed to be effective from March 21, but buyers were not interested.

We quote 4 x 4 in. soft Bessemer and open-hearth billets at $38.50, 2 x 2 in. billets at $42; sheet bars, $42; slabs, $41, and forging billets $51 base, all f.o.b. at mill, Pittsburgh or Youngstown.

Plates.—A local mill has received contracts for 3000 to 4000 tons of plates and shapes for work to be erected in Mexico, and which will start in a short time. None of the steel car companies is entering any new business, but they are taking in small lots of plates occasionally to be used in finishing up work on hand. There is still

a good deal of work in plates to be finished up for the Emergency Fleet Corporation and for several of the shipyards, but the plate mills have a very small amount of work ahead. The smaller mills are operating at about 50 per cent, but two of the largest mills in this district state they are running close to 75 per cent. We quote ¼ in. and heavier sheared plates at 2.65c., at mill, Pittsburgh.

Structural Material.—It develops that the contract for about 6000 tons of steel for the new machine shops at the Mare Island Navy Yard went to the American Bridge Co. The Jones & Laughlin Steel Co. has taken about 300 tons for an addition to the plant of the National Metal Molding Co. at Economy, Pa. Reports that the American Bridge Co. will erect a large fabricating plant at Monongahela, Pa., cannot be confirmed here, but are believed to be incorrect.

We quote beams and channels up to 15 in. at 2.45c. at mill, Pittsburgh.

Iron and Steel Bars.—Local mills report new demand for both iron and steel bars as very quiet, both jobbers and consumers placing orders only for actual needs and prompt shipment. It is said stocks are being worked off pretty fast and heavier buying in bars is looked for in the near future. All the bar mills are short of work, and this is resulting in some cutting in prices, about $2 per ton, and in some cases a little more.

We quote soft steel bars rolled from billets at 2.35c.; from old steel rails, 2.45c. Bar iron is quoted at 2.35c. for Eastern shipment and 2.55c. for Western shipment.

Sheets.—Several of the larger mills report that new orders and specifications for sheets last week were the best in some time, but whether this will continue is a question. It is said that jobbers' stocks are running low and they are buying more freely. Independent sheet mills are reported to be operating at 65 to 70 per cent of capacity, but on a 13 to 15-turn basis per week. The leading interest is said to be operating at about 50 per cent, taking advantage of the present quiet condition in the sheet trade to make needed repairs at some of its plants. Mills are a unit in reporting that prices on sheets, as effective from March 21, are being firmly held. These prices are given on page 1194.

Tin Plate.—It is getting closer to the time when large users of tin plate will have to start to lay in stocks, and this is already seen in increased orders reported by the mills in the past week. A few contracts were made recently by large consumers for shipment up to July 1, and specifications against these contracts are now coming forward. There is a fair amount of export inquiry, on which domestic prices are quoted, but as a rule these inquiries do not result in actual orders. Tin plate mills are operating on an average of about 50 per cent of normal capacity, but this rate of operation will likely be increased in the near future, as a much heavier demand is looked for, probably to start in May. Mills are adhering rigidly to prices, but jobbers who have stocks are quoting in some cases less than mill prices. We quote tin plate at $7 per base box, f.o.b. Pittsburgh, for delivery to July 1, and prices on terne plate are given on page 1194.

Wire Rods.—New inquiry is fair, and some small sales of soft rods and also screw rods are being made, and the mills report, at full prices. Export inquiries are fairly active, and on these domestic prices are now being quoted by all the makers. We notice sale of 300 tons of soft rods at $52 and 250 tons of screw rods at $57, f.o.b. mill. Common basic, or Bessemer rods, are held at $52; free-cutting Bessemer screw rods, $57; chain, screw, rivet and bolt rods, $60 per gross ton, f.o.b. Pittsburgh. Prices on high carbon rods remain arbitrary and range from $60 upward, depending on carbons.

Wire Products.—Several local mills report that specifications and new orders for wire and wire nails received last week and in the first two days of this week were heavier than for some time, but whether this will continue is a question. One week the specifications and orders are good, only to fall off very much the next week. Two or three local mills report holding prices firm, and are entering business at full prices effective from March 21. One mill received a specification for 3500 kegs of wire nails. New demand for barbed wire is fairly good, and several mills report they are well fixed on this product over the next several months. Prices on cement-coated nails are still being slightly shaded by a few makers in certain districts, ranging from 10c. to 15c. per keg. Prices on wire products are given on page 1194.

Hot-Rolled Strip Steel.—The new demand is not very active, being mostly for small lots for prompt shipment, neither jobbers or consumers showing any desire to anticipate. It is said the agreed price of $3.30 per 100 lb. is being firmly held.

Cold-Rolled Strip Steel.—This is also quiet in demand, both jobbers and consumers buying only in such quantities as actual needs require. Mills are operating at only about 50 per cent, owing to the dull demand.

We quote cold-rolled strip steel at $5.65 base per 100 lb. f.o.b. Pittsburgh, for 1½-in. and wider, 0.100 in. and thicker hard tempered in coils 0.20 carbon and under. Boxing charge 25c. per 100 lb.

Nuts and Bolts.—Makers report little new demand and only for small lots for prompt shipment to cover actual needs. One leading nut and bolt maker in this district is operating at only about 40 per cent of capacity. There is some shading of prices, but this is not serious, and makers claim that prices of steel and labor will have to be reduced before nuts, bolts and rivets can go much lower. Discounts are given on page 1194.

Shafting and Screw Stock.—Several makers report that last week and in the first two days of this week specifications and new orders for cold rolled shafting were larger than for some time. The automobile trade is buying quite freely, and some orders have lately been placed by the screw stock machine people. Implement makers are not specifying very freely, as this is their off season.

We quote cold-rolled shafting at 28 per cent off list to carloads and 23 per cent in less than carloads, f.o.b. Pittsburgh.

Hoops and Bands.—Makers continue to report the demand very light and say they are not operating at more than 40 to 50 per cent of capacity. A leading hoop and band mill in this district has been closed for several weeks for lack of orders. It is said the ruling price has been shaded in some cases. We quote hoops and bands at 3.05c., Pittsburgh, plus usual extras.

Spikes.—Some inquiries of fair size have come from the railroads in the past week, and the United States Railroad Administration has an inquiry out for 15,000 to 20,000 kegs, but several makers state they believe this is only a feeler and have not much hope that the order will be placed. The new demand for boat and barge spikes is reported slightly better.

We quote standard spikes, 9/16 x 4½ in. and also small spikes, $3.35 base per 100 lb. in carload lots of 200 kegs or more plus usual extras. Boat and barge spikes, $3.85 per 100 lb. in carload lots of 200 kegs or more.

Iron and Steel Pipe.—Pipe as regards demand and operation of the mills is in better condition than any other of the finished steel products. New demand for oil country supplies has been excessively heavy for some time, and several mills report they are filled up for 60 days or more, and are taking orders now for July and August delivery. The demand for line pipe for oil and gas projects, especially for oil-carrying lines, is also quite active, and mills are pointing out that companies deferring placing contracts for line pipe in the belief that prices will be lower are making a mistake and may not be able to get the pipe later in the year when they need it. Development of oil territory in Texas and also in Louisiana has been very active, the high prices ruling for oil allowing this development work to be carried on actively. Most of the large mills rolling iron or steel pipe are operating at 70 per cent of capacity or better. There are also some signs that the new demand for butt weld pipe, largely used for building purposes and which has been very

dull for some time, will be better in the near future. Recent orders for oil lines include 70 miles of 6-in., reported placed with a Western mill, also 30 miles of 4 in. placed with a local mill, and an active inquiry is in the market for 115 miles of 4 in., which may be closed at an early date. It is said mills are holding prices on iron and steel pipe, but some jobbers who have fairly heavy stocks which they desire to move more freely, are shading prices to some extent. Discounts on iron and steel pipe are given on page 1194.

Boiler Tubes.—Several makers report a slight increase in demand, with indications that it will still be larger in the near future. However, work on hand in the boiler and locomotive shops is not very heavy, and present consumption of tubes is not more than 50 per cent of the capacity of the mills, if that large. Discounts on tubes are given on page 1194.

Coke.—Not since 1907 has the output of coke in the upper and lower Connellsville regions been as small as it is at present, and the outlook is that still further reductions will be made both in quantity of coke being turned out and also in ovens in blast. Last week more than 500 ovens were blown out. Only 14,223 are active, or 39.4 per cent. Demand is very quiet. Foundries are not using more than 50 per cent of their normal requirements, and the demand for blast furnace coke has fallen off greatly owing to so many blast furnaces being idle. The quality of coke being shipped to blast furnaces is much better than a few months ago, and therefore furnaces are using less coke. Producers are keeping output about even with actual consumption, and this accounts for so many coke ovens being blown out. We quote best grades of blast furnace coke at $3.50 to $3.75 for prompt and $4 to $4.50 on contracts. Standard 72-hr. foundry coke loaded on cars, and which has to be moved, is offered as low as $4 to $4.25, while for future delivery, $4.50 to $5 is charged, depending on quality. Coke output in the upper and lower Connellsville regions for the week ended April 19 was about 147,000 tons, nearly 3000 tons less than the preceding week.

Old Material.—The local scrap market remains extremely quiet, the amount of material moving from dealers to consumers being very small. No local consumers are in the market as buyers at present, and there seems to be more anxiety on the part of dealers to sell. There would be no difficulty in getting heavy steel scrap at $15 or less. Demand from blast furnaces for borings and turnings has practically stopped. The Pennsylvania Railroad list came out under date of April 25, bids to be in on or before May 2, and awards are to be made on May 5. The lists are quite heavy this month, but local dealers are not bidding actively, as they say they do not know where they could dispose of the stock should they secure it. No sales of any moment were made in the past week. Prices quoted by dealers at this writing to consumers for delivery to mills in the Pittsburgh district and other consuming points that take Pittsburgh freights are as follows:

Heavy steel, melting, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh, delivered	$15.00
No. 1 cast, for steel plants	$18.00 to 19.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Franklin, Pa., and Pittsburgh	17.00 to 17.50
Compressed steel	13.00 to 13.50
Bundled sheet, sides and ends, f.o.b. consumers' mills, Pittsburgh district	11.50 to 12.00
Bundled sheet stamping	10.50 to 11.00
No. 1 busheling	14.00 to 14.50
Railroad grate bars	14.00 to 15.00
Low phosphorus melting stock (bloom and billet ends, heavy plates) ¼ in. and heavier	22.00 to 23.00
Iron car axles	29.00 to 30.00
Locomotive axles, steel	28.00 to 29.00
Steel car axles	25.00 to 26.00
Railroad malleable	15.00 to 15.50
Machine shop turnings	10.00 to 10.50
Cast iron wheels	20.00 to 21.00
Rolled steel wheels	17.00 to 18.00
Sheet bar crop ends (at origin)	18.00 to 18.50
Heavy steel axle turnings	12.00 to 13.00
Heavy breakable cast	18.00 to 19.00
Cast iron borings	10.50 to 11.00
No. 1 railroad wrought	19.00 to 19.50

Puddlers' Wage Rate Reduced to $13.30

YOUNGSTOWN, OHIO, April 29—(*By Wire*).—Puddlers' tonnage rates dropped from $15.05 to $13.30 as result of the bi-monthly settlement conducted to-day between representatives of the Western Bar Iron Association and the Amalgamated Association of Iron, Steel and Tin Workers. Bar iron was found to be selling the past 60 days at an average price of $2.75 per 100 lb., as compared with $3.10 at the February settlement. The new rate for the May-June period is lower than any of the rates prevailing during 1918. The peak rate for puddlers during the war was $16.80, on a selling price of $3.45.

More Sheet Mills in Operation

YOUNGSTOWN, OHIO, April 30.—Some improvement in sheet mill schedules is reported by operators this week. The Brier Hill Steel Co., the largest producer, is running on a 60 per cent basis at its works in Youngstown, Warren and Niles. The 132-in. plate mill has been suspended, leaving only the 84-in. in operation.

At the Youngstown Sheet & Tube Co. plant the puddle mill, idle for two weeks, resumed Monday. Other departments continue to operate under the same schedules as during the past two weeks. Eight of the Sheet & Tube Company's 14 sheet mills are in commission. Three blast furnaces are idle, two at Hubbard, Trumbull county, and one at the East Youngstown works.

At the Brown-Bonnell finishing plant of the Republic Iron & Steel Co. the 20-in. bar mill, 20-in. skelp, 7-in. continuous, 8 and 10-in. continuous mills started Monday. The blast furnace, open-hearth, Bessemer and tube mill departments are averaging about 55 per cent.

The Carnegie Steel Co. maintains operations at the Upper and Lower Union mills, the Ohio works and the McDonald plant at 90 per cent. The Sharon Steel Hoop Co. schedules at the Mahoning Valley works continue intermittent.

British Pig-Iron Output in 1918

The British pig iron output in 1918, according to the statistical bureau of the National Federation of Iron and Steel Manufacturers, was 9,939,429 gross tons as contrasted with 9,420,254 tons in 1917. The following table gives the production by grades in 1916, 1917 and 1918:

	1918	1917	1916
Forge	772,321	864,899	899,467
Foundry	1,296,394	1,162,982	1,418,824
Basic	3,166,556	3,082,562	2,296,549
Hematite	3,538,435	3,993,374	4,042,014
Spiegeleisen, ferromanganese and ferrosilicon	246,942*	296,524	291,845
Direct iron castings	18,780	20,053	105,284
Total	9,039,429	9,420,254	9,047,983

*Includes 23,078 tons of ferrosilicon.

The Cleveland district is credited with 2,424,139 tons of the 1918 total, most of it basic iron; the Scotland district made 1,062,645 tons, mostly hematite iron.

The Knox-Andreson Tool Co., which has had offices in the Empire Building, Pittsburgh, for several years, has taken a large store room on the ground floor of that building, in which it will carry in stock for quick service a full supply of drills, pneumatic tools, chucks and boring bars. This company represents in the Pittsburgh district the Bury Compressor Co., Erie, Pa.; Keller Pneumatic Tool Co., Grand Haven, Mich.; Van Dorn Electric Tool Co., Cleveland; Hannifin Mfg. Co., Chicago, air chucks; Hoefer Mfg. Co., Freeport, Ill., multiple spindle heads; Kelly Reamer Co., Cleveland. Stanley Whitsell, formerly with the American Bridge Co., recently joined the sales force of the Knox-Andreson Tool Co. This company also maintains a branch office in the Citizens' Building, Cleveland.

Cars for France

The Liberty Steel Products Co. has placed orders in the United States for 200 tank cars and 200 flat cars for shipment to French purchasers.

Chicago

CHICAGO, April 29—(*By Wire*).

The general situation continues unchanged with buying limited to immediate needs and the mills operating at a low percentage of capacity. The leading interest, which was on a 70 per cent basis last week, is now operating at close to 60 per cent. The only mills which are full are those rolling rails on reinstated orders. The foremost independent continues on the basis of a week ago, namely 65 per cent. The steel for the Butler Brothers building, amounting to about 10,000 tons, which was reported to have been placed locally last week, will be rolled and fabricated in the East, according to the architects.

A few of the ships in the North Pacific Coast program the construction of which was suspended by the Government, have been reinstated. Business in wire products continues good and in the case of the largest interest, is 80 per cent of normal. Track supplies are showing an upturn, a number of fair-sized orders and inquiries being received.

Purchases of pig iron are confined to small lots for immediate needs. Scrap is still weakening, as evidenced by further declines in prices.

Pig Iron.—Although the price situation still exercises a deterrent influence on purchases and has the effect of confining buying to small lots for immediate needs, such sales aggregate a fair total. When the recent price reductions were made applicable to standing contracts, it was done with the hope that the action would speed up deliveries on contracts; in fact, furnace representatives became rather insistent that shipments be no longer deferred, but it was not expected that much new business would be created for the first half. Dealers continue to assert a belief that prices will not be further lowered, basing their view on the high production cost, while they are generally holding to recent quotations. A Virginia furnace is willing to consider "reasonable" offers for small lots running high in silicon and manganese, and an eastern Kentucky furnace has for sale a small amount carrying a slightly higher silicon content than is usually obtainable at the price acceptable to the seller. The present activity is largely confined to foundry grades, and the only fair-sized inquiry of recent date is one which comes from a Minneapolis melter who wants 1400 tons. There is very little demand for basic or malleable.

The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable and steel-making irons, including low phosphorus, which are f.o.b. furnace, and do not include a switching charge averaging 50c. per ton:

Lake Superior charcoal, average silicon 1.50, second half delivery, f.o.b. furnace, average freight to Chicago $2.50 (other grades subject to usual differentials)	$29.25
Lake Superior charcoal, first half, nominal	38.85
Northern coke foundry, No. 1 silicon, 2.25 to 2.75	28.00
Northern coke foundry, No. 2 silicon, 1.75 to 2.25	26.75
Northern high-phosphorus foundry	26.75
Southern coke, No. 1 foundry and No. 1 soft silicon, 2.75 to 3.25	34.75
Southern coke, No. 2 foundry, silicon, 2.25 to 2.75	33.00
Southern foundry, silicon, 1.75 to 2.25	31.75
Malleable, not over 2.25 silicon	27.25
Standard Bessemer	27.95
Basic	25.75
Low phosphorus (copper free)	48.25
Silvery, 7 per cent	$41.15 to 41.55

Ferroalloys—Resale ferromanganese, which has sold recently at as low as $125 and $110 per ton delivered, is rapidly being exhausted. The supply of 10 per cent Bessemer ferrosilicon in resale lots has also been largely absorbed. Resale spiegeleisen, 18 to 22 per cent, is still available at $35 delivered. There is no great activity in any of the ferroalloys and producers continue to hold to quotations.

We quote 80 per cent ferromanganese, resale, at $125 delivered; 50 per cent ferrosilicon, resale at $100, delivered, and 16 to 18 per cent spiegeleisen at $35, furnace.

Plates.—No improvement in demand has developed and mills continue to operate on a hand-to-mouth basis. Four vessels included in the construction program on the North Pacific Coast, suspended by the Government, have been reinstated. These involve the use of about 14,000 tons of steel, some of which is now in the shipyards.

The mill quotation is 2.65c., Pittsburgh, the freight to Chicago being 27c. per 100 lb. Jobbers quote 3.67c. for plates out of stock.

Structural Material.—While the report was current a week ago that the steel for the Butler Brothers building had been let to a local mill, Graham, Anderson, Probst & White, architects of the structure, state the contract for both the rolling and fabricating has been awarded to the Bethlehem Steel Co. The plans call for about 10,000 tons, which constitutes the largest tonnage of steel placed for some time. The St. Paul Foundry Co. will fabricate 104 tons for a grade school and an addition to a boiler room at Mountain Iron, Minn. The Mosher Mfg. Co., Dallas, Tex., has been awarded a contract for 165 tons for an addition to Oak Cliff High School, Dallas. The Austin Brothers Bridge Co., Atlanta, Ga., will fabricate 148 tons of through riveted spans for Flint River bridge, Montezuma, Ga. The general situation is unchanged.

The mill quotation is 2.45c., Pittsburgh, which takes a freight rate of 27c. per 100 lb. for Chicago delivery. Jobbers quote 3.47c. for material out of warehouse.

Bars.—The demand has not taken any turn for the better. Such orders as are being received are for immediate needs and supply the mills with enough work for part time operation only. The agricultural implement business, which has been fair, is showing signs of slumping. Makers of rail-carbon steel hope for an increase in demand in connection with concrete construction work.

Mill prices are: Mild steel bars, 2.35c., Pittsburgh, taking a freight rate of 27c. per 100 lb.; common bar iron, 2.50 to 2.60c., Chicago; rail carbon, 2.45c., mill. Jobbers quote 3.37c. for steel bars out of warehouse.

Wire Products.—A large producer reports that more business has been done this month than in any of the three preceding months and, further, that it has been close to that secured in normal years. According to his estimate, it is at least 80 per cent. Orders are numerous and call for prompt delivery. For mill prices, see Finished Iron and Steel, f.o.b. Pittsburgh, page 1194.

Rails and Track Supplies.—The rail mills continue the most active of any. There is increasing activity in track fastenings, some fair sized orders and inquiries being reported, among them orders for 1500 tons of tie plates and 2000 kegs of bolts and an inquiry for 25,000 kegs of spikes.

Standard railroad spikes, 3.35c., Pittsburgh. Track bolts with square nuts, 4.35c., Pittsburgh. Steel tie plates and iron angle bars, 2.75c., Pittsburgh and Chicago; tie plates, iron, 2.75c., f.o.b. makers' mills. Light rails, 2.45c., f.o.b. makers' mills, with usual extras.

Bolts and Nuts.—Business continues fair, but by no means approaches normal. For mill prices, see Finished Iron and Steel, f.o.b. Pittsburgh, page 1194. Jobbers quote:

Structural rivets, 4.77c.; boiler rivets, 4.72c.; machine bolts up to ⅞ x 4 in., 55 per cent off; larger sizes, 40 off; carriage bolts up to ⅞ x 6 in., 40 and 10 off; larger sizes 35 off; hot pressed nuts, square tapped, $1.73 off; hexagon tapped, $1.73 off; coach or lag screw, gimlet points, square heads, 50 and 10 per cent off. Quantity extras for nuts are canceled.

Cast Iron Pipe.—St. Paul will let 566 tons to-day. On May 1 Jackson, Mich., will let 350 tons, and Fort Dodge, Iowa, 110 tons. Faribault, Minn., will award 70 tons on May 5. An inquiry from Java was recently received by a local interest, the tonnage being small.

We quote per net ton, f.o.b. Chicago, ex-war tax, as follows: Water pipe, 4-in., $59.80; 6-in. and larger, $56.80; class A and gas pipe, $1 extra.

Old Material.—Some additional purchases of heavy melting steel have been made at $16, but otherwise the market has been devoid of activity. The weakness in scrap has resulted in further price reductions in a number of items. The only railroad offering of note is one

of 1200 tons by the Chicago & Alton, which includes 500 tons of rerolling rails.

Per Gross Ton

We quote delivery in buyers' yards, Chicago and vicinity, all freight and transfer charges paid, as follows:

Iron rails	$21.00 to $22.00
Relaying rails	35.00 to 45.00
Carwheels	21.00 to 22.00
Steel rails, rerolling	17.50 to 18.00
Steel rails, less than 3 ft.	17.50 to 18.00
Heavy melting steel	15.75 to 16.25
Frogs, switches and guards cut apart	15.75 to 16.25
Shoveling steel	15.50 to 16.00

Per Net Ton

Iron angles and splice bars	$18.25 to $19.25
Steel angle bars	15.00 to 15.50
Iron arch bars and transoms	22.00 to 23.00
Iron car axles	27.00 to 28.00
Steel car axles	23.00 to 24.00
No. 1 busheling	13.50 to 14.00
No. 2 busheling	9.00 to 9.50
Cut forge	14.00 to 14.50
Pipes and flues	12.50 to 13.00
No. 1 railroad wrought	15.50 to 16.00
No. 2 railroad wrought	14.00 to 14.50
Steel knuckles and couplers	16.25 to 16.75
Coil springs	17.50 to 18.00
No. 1 cast	20.00 to 21.00
Boiler punchings	18.00 to 19.00
Locomotive tires, smooth	17.00 to 17.50
Machine shop turnings	5.00 to 6.00
Cast borings	8.50 to 9.00
Stove plate and light cast	15.75 to 16.25
Grate bars	15.00 to 15.50
Brake shoes	14.00 to 14.50
Railroad malleable	15.00 to 16.00
Agricultural malleable	15.00 to 15.50
Country mixed	10.50 to 11.50

Philadelphia

PHILADELPHIA, April 29.

Although Director General Hines has announced his willingness to enter another conference on steel prices with the Industrial Board of the Department of Commerce and the steel producers, there is no optimism here that such a conference will result successfully, this being due to Mr. Hines' apparent expectation that the steel trade will agree to further reductions. Some of the high-cost producers in this district will strenuously oppose any further reduction. The whole trade would welcome an end to the controversy. While technically there is to-day an open market, actually it is one where uniform selling prices prevail almost without exception. Sellers admit that such a situation is displeasing to consumers, who receive identical bids from all steel makers on their inquiries. There are reports of concessions, but these are very difficult to verify, and in certain instances have been proved untrue. Base prices, at least, are being well maintained, and concessions, if any, are granted in the form of larger discounts for cash payments, or in waiving certain extras. For example, one or two makers of cold-rolled steel are said to be selling less than carload lots at the carload discount. Such cutting is relatively unimportant, and does not extend to the major steel products, so far as known. The only important sale in this market during the past week was 1000 tons of open-hearth rerolling billets which went to a mill outside of this district at the full price of $38.50, Pittsburgh. It is stated that the buyer got quotations from a number of makers and was unable to shade this price. The same situation holds true also of pig iron. On one inquiry for 500 tons of No. 2 X foundry iron there were seven identical bids of $31.90, delivered Philadelphia district, equivalent to $28 at Pittsburgh, plus $3.90 freight. There is not enough business in sight to offer pig iron sellers any incentive for quoting lower prices, though it is unquestionably true that a good-sized inquiry would find some sellers willing to shade prices upon assurance that the business actually would be placed.

If orders for steel products do not show a speedy improvement, some of the Eastern mills will doubtless shut down entirely within the next few weeks. Present operations vary from about 35 to 50 per cent, with about 40 to 45 per cent representing the average. Even at this rate of production, all of the steel made is not going out in the form of rolled products, a considerable tonnage of cold steel being piled at some plants.

Pig Iron.—In the absence of any important sales, pig iron prices remain nominally unchanged. Though there is little disposition among sellers to shade prices on the small lots of iron now being sold, a good-sized inquiry, accompanied by assurance from the consumer that the business actually would be placed, undoubtedly would find some sellers willing to accept the order at 50c. or perhaps even $1 below present published quotations. In making quotations on inquiries, the eastern Pennsylvania furnaces are adhering to the base price of $26.75, Pittsburgh, for No. 2 plain iron, the freight rate to the Philadelphia district being $3.90. On a recent inquiry a consumer in this district received seven identical bids of $31.90, delivered for No. 2X iron, a furnace a few miles from his foundry quoting the same delivered price as those located farther away. It is admitted that such a condition could not long exist if consumers came into the market ready to place fairly substantial orders, but as present business consists only of an occasional carload, there is no incentive for producers to cut prices. The Pittsburgh basis will be the first relic of a controlled market to disappear under strictly competitive conditions. A pig iron merchant has offered two furnaces an order for 2000 tons of foundry iron for May-June delivery at $24, furnace. Both refused, one stating the price to be below cost of production. There are few consumers who are willing to buy ahead, and those who have inquired ask for a guarantee against a decline in price, which sellers are not willing to grant. A distributer of iron estimates that 90 per cent of his foundry customers have a sufficient supply of iron to last until July 1 at the present rate of consumption, a majority of jobbing foundries operating only two, three or four days a week. There appears to be no possibility of any important demand for basic pig iron before third quarter. Meanwhile merchant blast furnaces are completing shipments on contracts as rapidly as possible and many of them will then go out of blast. One furnace now out of blast will not be blown in again until costs can be reduced to $20 a ton, which is not an immediate prospect. We quote standard grades of iron for delivery in the Philadelphia district nominally as follows, except low phosphorus iron, which is quoted f.o.b. furnace:

Eastern Penna. No. 2 X (2.25 to 2.75 sil.)	$31.90
Eastern Penna. No. 2 plain (1.75 to 2.25 sil.)	30.65
Virginia No. 2 X (2.25 to 2.75 sil.)	31.60
Virginia No. 2 plain (1.75 to 2.25 sil.)	30.60
Basic	29.65
Gray forge	29.65
Standard low phosphorus (f.o.b. furnace)	46.75
Copper-bearing low phosphorus (f.o.b. furnace)	43.75

Ferroalloys.—An attempt has been made by some producers to determine the quantity of ferromanganese and spiegeleisen still available for resale. The opinion is that most of the ferromanganese recently offered for resale has been disposed of, but new lots are coming in from England which may come upon the market. One cargo of 1200 tons will be received this week at Baltimore to apply on old contracts. There is still a fairly liberal supply of resale spiegeleisen, one company in this district having 1500 tons on hand. Resale material is still making the market, 78 to 82 per cent ferromanganese being obtainable at around $110, while 18 to 22 per cent spiegeleisen can be had at about $35. In some cases, these prices include freight to destination.

Billets, etc.—There is comparatively little demand for semi-finished steel, therefore the sale of 1000 tons of 4 x 4 in. open-hearth rerolling billets to a consumer in this district assumes unusual importance. This consumer is reported to have received identical bids of $38.50, Pittsburgh, from several makers, and the business was placed at that price. A sale of 165 tons of forging slabs at $51, Youngstown, is also noted, the buyer assuming the Youngstown to Pittsburgh freight.

Plates.—The plate market is possibly the most inactive of any, though the whole steel market is extremely dull. A number of Eastern mills are idle, being operated only when an accumulation of small orders makes a rolling possible. The low bid submitted to the Navy Department on 25,000 tons of armor plate was

11½c. per lb. We quote sheared plates ¼-in. and heavier at 2.895c., Philadelphia.

Structural Material.—Railroad engineers are working upon a number of bridge jobs, but so far the Railroad Administration has not authorized the taking of bids. The steel trade and fabricators are more hopeful that a fair amount of structural business will be placed soon if the price situation is freed from present disturbing influence due to the attitude of the Railroad Administration. The Phoenix Bridge Co. was low bidder and received the contract for an extension of the Frankford elevated railroad, Philadelphia. About 1600 tons of steel will be required, the bid price being approximately 5c. per lb. for fabrication and erection. This was below the cost estimated by the city engineers. We quote plain material at 2.695c., Philadelphia.

Bars.—Two Eastern bar iron mills are still closed owing to a strike of employees who refused to accept a cut in wages. The National War Labor Board was appealed to by the workers, but is understood to have declined to take any action. Little business is being done in either iron or steel bars. We quote bar iron and soft steel bars at 2.595c., Philadelphia, 1c. per lb. more being asked for double refined bar iron.

Sheets.—Practically nothing is being done in sheets. Prices quoted on mill shipments for delivery in the Philadelphia district are: No. 10 blue annealed, 3.795c.; No. 28 black, 4.595c.; No. 28 galvanized, 5.945c.

Old Material.—The market is a waiting one. Those who hold scrap are in most instances unwilling to sell at prices at present being offered, believing that within the next 60 or 90 days much more can be obtained. Dealers having contracts to fill have offered $15 for No. 1 heavy melting steel but have not found takers, though a few small lots have been sold at $15.25. Prices show some declines, but the market is largely nominal. At a meeting of representatives of the scrap trade with officials of the Director of Sales office, War Department, in Washington last week suggestions were made as to the disposal of 453,000 tons of iron and steel scrap, mostly shell steel. Full details of this meeting are published elsewhere in this issue. The main contention of the scrap dealers is that the Government should dispose of its scrap by advertising for bids, so that consumers and dealers alike would have an opportunity to make tenders for the material. It is also desired that the scrap be sold as quickly as possible so that it will be eliminated as a disturbing element in the market. We quote for delivery at consumers' works in eastern Pennsylvania as follows:

No. 1 heavy melting steel	$15.00 to $15.50
Steel rails, rerolling	17.50 to 18.00
No. 1 low phosphorus, heavy, 0.04 and under	22.50 to 23.00
Iron rails	20.00 to 22.00
Carwheels	22.00 to 23.00
No. 1 railroad wrought	21.00 to 22.00
No. 1 yard wrought	20.00 to 21.00
Country yard wrought	12.00 to 15.00
No. 1 forge fire	12.00 to 13.00
Bundled skeleton	12.00 to 13.00
No. 1 busheling	15.00 to 16.00
No. 2 busheling	13.00 to 14.00
Turnings (short shoveling grade for blast furnace use)	10.50 to 11.50
Mixed borings and turnings (for blast furnace use)	9.50 to 10.50
Machine-shop turnings (for rolling mill use)	11.00 to 11.50
Cast borings (clean)	13.00 to 14.00
No. 1 cast	22.00 to 23.00
Grate bars	17.00 to 18.00
Stove plate	17.00 to 18.00
Railroad malleable	18.00 to 19.00
Wrought iron and soft steel pipes and tubes (new specifications)	18.00 to 18.50
Ungraded pipe	13.00 to 14.00

According to the *Seedienst*, of Amsterdam, Holland has up to the present contracted for the delivery of 40,000 tons of steel from America. It is not expected that this contract will be increased, as Holland has still running contracts with European countries, principally with Germany, which will fully cover her requirements.

Cleveland

CLEVELAND, April 29.

Iron Ore.—Shippers have reduced prices on all Lake Superior ores 20c. per ton, following the reduction from $1 to 80c. in the net vessel rate from the ports at the head of the Lakes and a reduction at the same rate, or 20 per cent, from other ports. The new prices are in conformity with the decision of the recent Washington price conference, which left late 1918 prices unchanged, but subject to any reduction in either the rail rates from the mines or vessel rates, thus giving the consumer instead of the ore shippers the benefit of any reduction in carrying charges. The few ore contracts that have been placed up to the present time were at the late 1918 prices, but had a rider which provided that the buyer would be given the benefit of any reduction in transportation charges. With the formal changing of the prices, contracts taken from now on will provide that the prices named shall be subject to any change that may be made during the season in the railroad rates or in the Government tax. The application made by some of the railroads to increase the unloading charge from 10 to 15c. per ton at Lake Erie ports was considered at a meeting held in Pittsburgh, April 25, and refused. Consequently, ore consumers will get the full benefit of the 20c. per ton reduction in carrying charges. The new carrying charges are 80c. per ton net, from Duluth, 72c. from Marquette, and 60c. from Escanaba. Very little ore is being sold, and the outlook for business during the next few weeks is not very promising. One sale of 25,000 tons was made during the week and a few other small-lot sales are reported. Some of the ore firms will begin shipping ore this week in a small way, but indications are that the movement will not get well under way before near the first of June. The iron ore carrying capacity of the Lake fleet has been reduced 520,000 tons this year, based upon a carrying season of 20 trips. This year there are 377 ore carriers, with an aggregate trip carrying capacity of 3,029,000 gross tons, as compared with 3,055,400 gross tons last year. The reduction in vessel tonnage has resulted from the requisitioning of Lake vessels for the ocean trade. New ore prices, delivered f. o. b. lower Lake ports, are as follows:

Old range Bessemer, $6.45; old range non-Bessemer, $5.70; Mesaba Bessemer, $6.20; Mesaba non-Bessemer, $5.55

Pig Iron.—The pig iron market shows very little life. Sales are limited to early requirements or for delivery before July 1, and orders generally are from one carload to 100-ton lots. One interest reports sales during the week aggregating 3200 tons, nearly all in foundry iron, the remainder being in the malleable grade. All sales reported were made at regular prices, and there seems to be no disposition among producers to shade these prices. Because of the uncertainty about prices and general conditions, consumers are not inclined to buy for the last half. A sanitary interest is inquiring for 1000 tons of Southern iron for May shipment, but with that exception no good-sized inquiry is pending. Furnace companies that recently advised their trade that they would revise prices by making new contracts making the minimum price $26.75 for No. 2 foundry iron, and providing that should prices advance a corresponding advance should be made on the undelivered portion up to a maximum of $31, the price of the old contracts, have made new contracts with most of their consumers on that basis, and state that the plan is generally meeting with favor among the consumers. Two interests so far have not made any revision of old contracts. We quote delivered, Cleveland, as follows:

Bessemer	$29.35
Basic	27.15
Northern No. 2 foundry	27.15
Southern No. 2 foundry, silicon 2.25 to 2.75	33.00
Gray forge	26.15
Ohio silvery, silicon 8 per cent	42.65
Standard low phos., Valley furnace	45.75

Tool Steel.—Resale high speed tool steel is still having a softening effect on prices and some makers are now quoting this steel at $1.60 per lb. Others are adhering to $1.70.

Finished Iron and Steel.—The demand for steel bars for reinforcing purposes has become more active, and among new inquiries is one for 850 tons for a sewage disposal plant in Cleveland. Considerable building work that will require structural steel is now in the hands of architects but the only job of any size placed in the week was 600 tons for a plant extension for the Mansfield Sheet & Tin Plate Co., which was taken by the Massillon Bridge & Structural Co. The tonnage on the books of a number of the mills is being reduced, and unless the demand becomes more active there will be a further curtailment of production. Some mills report a slight improvement in the volume of orders from manufacturers and fabricators but the automobile industry is the only one that is placing a steady volume of orders. Other consumers are buying in very small lots and only for immediate requirements and many inquiries that are coming out are not resulting in business, buyers apparently awaiting developments in Washington on the stabilizing of prices. There is little demand for light rails, buyers, largely coal mining companies, holding back and an export inquiry for 2500 tons has been withdrawn. The Nickel Plate Railroad has placed 2000 kegs of spikes. Alloy steel continues in good demand from the automobile trade and inquiries for several lots are now pending. Sheet mills are well filled with orders for finished sheets for the automobile trade but other sheets are in light demand. Some plate mills continue to quote plate differentials instead of blue annealed sheet prices on sheets between ¼ in. and No. 12 gage. Mills generally appear to be adhering to regular prices on steel bars, plates and structural material. The price of hard steel bars is being well maintained at 2.25c., which is now the general quotation. Warehouse prices are as follows:

Steel bars, 3.27c.; plates, 3.57c.; structural shapes, 3.87c.; bands and hoops, 3.97c.; No. 10 blue annealed sheets, 4.47c.; No. 28 black sheets, 5.27c.; No. 28 galvanized sheets, 6.62c.

Coke.—There is very little activity in the coke market. A few sales of foundry coke are reported for early shipment. We quote standard Connellsville foundry coke at $5.25 to $5.75 per net ton at oven. Some Wise County coke is being sold at $6.

Old Material.—Following a spurt during which considerable scrap was purchased by the American Steel & Wire Co. and another Cleveland consumer, the market is again dull. There is no demand from the mills, but some activity on the part of dealers who are placing orders with producers to cover contracts. This activity is almost wholly in heavy melting steel, borings and turnings. Heavy steel is softer, dealers offering $14.75 to $15 for this grade, and they are unwilling to pay above the heavy-steel price for low phosphorus melting scrap. There is a wide range in prices on borings and turnings, which are bringing considerably better prices for Cleveland delivery than for out-of-town shipment. The supply is in excess of the local demand. For Cleveland delivery, borings are quoted at $10 to $10.50, and turnings as high as $9.75. Cast scrap is weak, there being practically no demand for this grade from foundries. We quote delivered consumers' yards in Cleveland and vicinity, as follows:

Heavy melting steel	$14.75 to $15.00
Steel rails, under 3 ft	14.75 to 15.00
Steel rails, rerolling	15.50 to 16.00
Iron rails	23.00 to 24.00
Iron car axles	29.50 to 30.00
Steel car axles	27.50 to 28.50
Low phosphorus melting scrap	16.25 to 17.00
Cast borings	9.50 to 10.50
Iron and steel turnings and drillings	8.25 to 9.50
Compressed steel	12.50 to 13.00
No. 1 railroad wrought	17.00 to 17.50
Cast iron car wheels	22.00 to 22.50
Agricultural malleable	14.00 to 15.00
Railroad malleable	17.00 to 17.50
Steel axle turnings	13.00 to 13.50
Light bundled sheet scrap	10.00 to 11.00
No. 1 cast	21.00 to 22.00
No. 1 busheling	13.00 to 13.50
Heavy forge flashings, 10 in. and under	13.00 to 13.50
Light forge flashings, over 10 in.	9.50 to 10.00
Railroad grate bars	16.00 to 16.50
Stove plate	16.75 to 17.50

Bolts, Nuts and Rivets.—New demand for bolts and nuts is very light, and orders are probably not over 50 per cent of capacity of plants. Consumers and jobbers are buying only for immediate requirements. Regular prices are being maintained. The demand for rivets is very light, and some manufacturers, in their eagerness for orders, are reported to be shading prices. New business at present amounts to only about 35 per cent of the capacity of plants, but so far some manufacturers with old orders on their books are able to keep their plants running at about 80 per cent of capacity.

Buffalo

BUFFALO, April 28.

Pig Iron.—Inquiry continues to dwindle, with just a little dribble of sales, amounting to an exceedingly small aggregate, 250 tons of malleable being the largest order reported during the week. Furnacemen report the status of the market as absolutely lifeless. All producers of the district have some stacks out of blast, and in some instances are operating only 40 to 60 per cent of capacity. Melters are not buying except for specific immediate needs, not caring to take chances on buying ahead at present prices. A few foundries report operations as being on a little heavier scale this week than last, but many of them are running below normal and in almost all cases their present needs are fully covered by shipments made on contracts made some time ago. It is not anticipated there will be any reaction or buying movement until the peace treaty is signed and the price situation straightens out. All furnaces of the district are adhering strictly to the schedule of prices inaugurated March 21. We quote as follows, f.o.b. furnace, Buffalo:

No. 1 foundry, 2.75 to 3.25 silicon	$29.75
No. 2 X, 2.25 to 2.75 silicon	28.00
No. 2 plain foundry, 1.75 to 2.25 silicon	26.75
Gray forge	25.75
Malleable, silicon not over 2.25	27.25
Basic	25.75
Basic, 1 to 1½ per cent manganese	26.25
Basic, 1½ to 2½ per cent manganese	26.75
Bessemer	27.95

Old Material.—The market is devoid of any great activity, but there is a good demand for borings, machine shop turnings and heavy axle turnings, this demand being principally from outside points. Dealers are optimistic and are not showing any anxiety to sell at any reduction in price, anticipating that as soon as the "deadlock" is lifted a strong demand will appear. There has been no change in prices. We continue the schedule current last week, which is as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel, regular grades	$14.50 to $15.50
Low phosphorus, 0.04 and under	21.00 to 22.00
No. 1 railroad wrought	19.00 to 19.50
No. 1 machinery cast	21.00 to 22.00
Iron axles	23.00 to 24.00
Steel axles	23.00 to 24.00
Carwheels	21.00 to 22.00
Railroad malleable	17.00 to 18.00
Machine shop turnings	8.50 to 9.50
Heavy axle turnings	13.00 to 14.00
Clean cast borings	11.00 to 12.00
Iron rails	21.00 to 22.00
Locomotive grate bars	16.00 to 17.00
Stove plate	18.50 to 19.00
Wrought pipe	13.00 to 14.00
No. 1 busheling	13.00 to 14.00
Bundled sheet stamping	11.00 to 12.00

Finished Iron and Steel.—Business has been very quiet for the week in general finished lines, but is showing some increase in activity in building inquiries. There is a feeling now that it does not matter whether the Industrial Board and the Railroad Administration get together or not; that the benefits that were to accrue are largley lost, but that business will now gradually go ahead as confidence becomes established. A large amount of new business is discernible in the offing, but when it will take shape in the form of orders is problematical. Producers are vigorously maintaining that prices cannot be further reduced without a sharp reduction in wages, and they are loath to inaugurate a policy looking toward such reduction. There are re-

ports that lower prices are being made but this cannot be verified. One producer of plates reports inquiry for a considerable tonnage of tank plates during the week.

Steel bars, 3.45c.; iron bars, 4.15c.; shapes, 3.55c.; plates, 3.75c.; No. 10 blue annealed sheets, 4.65c.; No. 28 black, 5.70c.; No. 28 galvanized sheets, 7.05c.

St. Louis

ST. LOUIS, April 28.

Pig Iron.—The situation in the pig iron market shows very little change, and while there is some buying of small lots being put through, it is for immediate or special needs. At the same time there is some little indication of inquiry for last half delivery and there is a feeling that if some adjustment could be reached in connection with the attitude of the Railroad Administration there would be a disposition to buy more freely. The melters, however, are in a somewhat independent frame of mind because of the iron in their yards or under contract.

Coke.—No business at all is appearing in coke and the market, therefore, is presenting no features of moment, either as to metallurgical coke or fuel for domestic uses.

Finished Iron and Steel.—In finished products there is a steadily increasing demand, although this is not in the shape of large contracts, but rather in the way of a fair aggregate of small purchases. This increase, however, is probably due to activity being shown in other lines of business than iron and steel in this territory. Movement out of warehouse is fair. We quote for stock out of warehouse as follows:

Soft steel bars, 3.44c.; iron bars, 3.44c.; structural material, 3.54c.; tank plates, 3.74c.; No. 8 blue annealed sheets, 4.59c.; No. 10 blue annealed sheets, 4.64c.; No. 28 black sheets, cold rolled, one pass, 5.44c.; No. 28 galvanized sheets, black sheet gage, 6.79c.

Old Material.—Although there has been improvement of tone in the past week, it is more a matter of sentiment than of definite transactions. The dealers seem to feel that there will be no lowering of prices, and while they cannot sell much material, there is no disposition to let any of the scrap on hand or under contract go at anything less than the current quotations. The mills and foundries are not buying any new material from the scrap dealers, and they are continuing their severity of inspection. We quote dealers' prices f.o.b. St. Louis district, consumer's works, as follows:

Per Gross Ton	
Old iron rails	$22.00 to $23.00
Old steel rails, rerolling	17.25 to 17.75
Old steel rails, less than 3 ft.	16.50 to 17.00
Relaying rails, standard sections, subject to inspection	40.00 to 45.00
Old carwheels	22.00 to 22.50
No. 1 railroad heavy melting steel	15.00 to 15.50
Heavy shoveling steel	14.00 to 14.50
Ordinary shoveling steel	13.00 to 13.50
Frogs, switches and guards, cut apart	15.50 to 16.00
Ordinary bundled sheets, scrap	9.00 to 9.50
Heavy axle and tire turnings	9.00 to 9.50
Per Net Ton	
Iron angle bars	$16.00 to $16.50
Steel angle bars	14.50 to 15.00
Iron car axles	26.00 to 26.50
Steel car axles	21.50 to 22.00
Wrought arch bars and transoms	19.00 to 19.50
No. 1 railroad wrought	16.00 to 16.50
No. 2 railroad wrought	14.00 to 14.50
Railroad springs	15.00 to 15.50
Steel couplers and knuckles	15.00 to 15.50
Locomotive tires, 42 in. and over, smooth inside	14.50 to 15.00
No. 1 dealers' forge	11.50 to 12.00
Cast iron borings	7.50 to 8.00
No. 1 busheling	13.50 to 14.00
No. 1 boiler cut to sheets and rings	11.00 to 11.50
No. 1 railroad cast	20.00 to 20.50
Stove plate and light cast	15.50 to 16.00
Railroad malleable	13.50 to 14.00
Pipes and flues	11.00 to 11.50
Heavy railroad sheet and tank	10.00 to 10.50
Railroad grate bars	12.00 to 12.50
Machine shop turnings	6.50 to 7.00
Country mixed	11.00 to 11.50
Uncut railroad mixed	12.50 to 13.00
Horseshoes	14.50 to 15.00

Birmingham

BIRMINGHAM, ALA., April 28.

Nearly every interest reports daily sales of carloads and somewhat larger amounts, all for prompt delivery. There seems no present prospect of foreign trade, although there are more or less vague inquiries from Holland, Belgium, Japan and Italy. Nothing came of the inquiry from Genoa or from the inquiry for a large amount of basic from Great Britain. Makers are uniform in asking the market price fixed recently and for the silicon differentials. It seems well established that the recent instances of underbidding were on the part of brokers or other third parties. It is very likely that another stack will go out during the week, reducing the active list to 15. Fortunately for iron stacks of the leading interest, finishing mills continue to demand a large quota of basic and its nine active stacks have not been reduced in number. Southern iron operators, outside of perhaps one interest, never thought much of the Redfield plan, and are more than ever convinced that it would be better if the Government formally announced that its hands were off. One 15 per cent wage cut was made by a steel interest without friction. Idle ore miners, who struck when a wage cut was made, have agreed to the cut and will accept it when there is demand for the ore. We quote per gross ton f.o.b. Birmingham district furnaces as follows:

Foundry, 1.75 to 2.25 silicon	$26.75
Basic	25.75

Cast-Iron Pipe.—The cast-iron pipe trade improves slightly each week, but there is an obstinate perseverance in purchasing only for immediate and pressing needs. Sanitary pipe brokers order only on sales previously made by them and water pipe is taken only in such quantities as must be had right now. The leading interest is interesting itself in castings for sugar-house machinery, with which this district has long supplied Cuba, Porto Rico, Louisiana and Mexico.

Coal and Coke.—The remarkable activity in domestic coal features that line, but steam mines operate at not over 50 per cent capacity. Not all coke makers have dropped to the price of $8 for 72-hr. hand-picked, but those who have not are delivering only on old contracts. Mexican business has been cut off for the time being. Coke generally is dull.

Old Material.—The market remains dull except as to cast scrap, which continues to change hands in considerable quantities. There has been a slight increase in the demand for heavy melting steel. We quote per gross ton f.o.b. Birmingham district yards prices to consumers as follows:

Steel rails	$10.50 to $11.00
No. 1 heavy steel	11.00 to 12.00
Cast iron borings	6.00 to 6.50
Machine shop turnings	6.00 to 6.50
Stove plate	13.00 to 13.50
No. 1 cast	19.00 to 19.50
Car wheels	19.00 to 19.50
Tramcar wheels	18.00 to 18.50
Steel axles	17.00 to 18.00
No. 1 wrought	12.00 to 13.00

San Francisco

SAN FRANCISCO, April 22.

The labor situation on the Coast has by no means yet reached permanent settlement. The Iron Trades Council has sent notice to the Metal Trades Association declaring that the agreements of Jan. 2, 1918, and of Jan. 20, 1919, are no longer agreeable to the council. This means that the plants are now being operated without any form of agreement. At the last meeting of the Iron Trades Council evidence was introduced which tended to show that about 40 of the 250 operating engineers at the Union and Alameda plants of the Bethlehem Shipbuilding Corporation were not receiving the scale of $6.40 per day. Authority to strike was given, and the two plants may be tied up if adjustment is not immediately made.

The iron and steel trade in general is still waiting. At present the dispute between the Railroad Administration and the Industrial Board over the just price

to charge for materials is holding up buying. Notwithstanding this, there is more life in reinforcing bars and in pipe than for some time. The latter promises to show further developments, as there is a good prospect of considerable export business. Several tons of brass valves were recently shipped to Java, and this is construed to mean that a demand for pipe will follow.

Finished Material.—The market for bars is better than for some time, and this is attributed to the fact that there is considerable building of concrete structures in the interior. There is practically no demand for structurals, as most of the buildings going up in the State do not need large shapes. Early in the fall the Bank of Italy is to erect a large steel-frame building at Powell and Market streets. But this is the only important job of its kind in sight at the present time.

Wrought Pipe.—Inquiry for wrought pipe continues brisk, but no sales of importance are reported. The supervisors of Kern County are figuring on spending $25,800 on steel pipe in connection with the Oildale Waterworks System.

Cast-Iron Pipe.—The demand for cast-iron pipe is showing considerable improvement, and it is evident that the users have decided to wait no longer for lower rates. Bellingham, Wash., received bids April 17 on 200 tons of 18-in. and 24-in. pipe, and rejected them. It is now calling for new bids to be opened April 24. Alhambra has received bids for 4, 6, 8 and 14-in. pipe, and recently awarded the contract to the American Cast Iron Pipe & Foundry Co.

Pig Iron.—Fill-in orders on pig iron made up the bulk of sales on the Coast. There is no business of size in sight.

Old Materials.—The big mills are seemingly making an effort to force down the price of scrap still further. There is practically no scrap coming into this market at present, but the demand is so light that no one is suffering for material. While no quotations are obtainable for scrap, the general feeling is one of weakness.

New York

NEW YORK, April 29.

Pig Iron.—A new export freight rate on pig iron from Pittsburgh to the Pacific Coast has been announced, it being 55c. per 100 lb., compared with the recent rate of 75c. Exporters are glad to see the tendency to reduce freight rates to help in the export business, but it is possible to ship pig iron from Pittsburgh to Japan or China via Atlantic ports at present for about $23.90 and with the new rate from Pittsburgh to the Pacific Coast the rate from Pittsburgh to Japan or China by that route will be about $25.60; hence the new rate is not likely to start any movement from Pittsburgh to the Pacific Coast. Owing to the advances in the price of pig iron in England and the downward tendency of ocean freight rates, interest in exports is more active and some exporting is being quietly done. The domestic market is extremely quiet and foundries are buying only very small tonnages. We quote as follows, delivered New York, for Northern and Southern grades:

No. 1 foundry, silicon, 2.75 to 3.25	$31.55
No. 2 X, silicon, 2.25 to 2.75	29.80
No. 2 plain, silicon, 1.75 to 2.25	28.55
No. 2 X, Virginia, silicon, 2.25 to 2.75, $31.90 to	32.40
No. 1 Southern, silicon, 2.75 to 3.25	37.45
No. 2 Southern, soft (all rail), sil. 2.25 to 2.75.	35.70
No. 2 Southern (all rail), sil., 1.75 to 2.25	34.45

Ferroalloys.—Demand for ferromanganese continues light with transactions still limited to carload lots, most of which are reported to have been resale material at $110, delivered. Producers continue to quote $150, delivered, for 78 to 82 per cent alloy with $2 deducted for each unit below 78 per cent. Imports of ferromanganese for March were 5741 tons, making the total for the first quarter 9211 tons, which is in excess of 3000 tons more than was imported in the same quarter a year ago. The spiegeleisen market is extremely inactive and in the absence of transactions is extremely inactive and in the absence of transactions of any consequence it is believed that 16 to 19 per cent alloy could be obtained at about $37.50 delivered. We quote the market nominal at $37.50 to $42 delivered. Imports of manganese ore continue very heavy, those for March having been 48,238 gross tons, making the total for the first quarter of this year 115,221 tons or only about 3000 tons less than those for the same quarter a year ago. No transactions in manganese ore have been heard of recently, the latest offering having been 55c. per unit for Indian ore at the seaboard. The market for ferrosilicon, 50 per cent, is extremely dull with material for spot or forward delivery quoted at $90, delivered, but it is understood that there is still considerable resale material available at lower prices. Some export business has been done in 50 per cent ferrosilicon as well as in the electric 15 per cent grade, which is quoted at $55, delivered, for domestic consumption. Quotations for ferrotungsten are difficult to obtain in the absence of any real test of the market but it is believed that the alloy can be secured at around $1 to $1.25 per lb. contained tungsten. Ferrochrome, 60 to 70 per cent, carload lots, is nominal at 32c. to 34c. per lb. of contained chromium, depending on carbon content. In small lots 2c. per lb. more is added. Ferrochrome, carbon free, 60 per cent chromium, is obtainable at 70c. per lb. of alloy. Ferrovanadium is quoted at $6 per lb. of contained vanadium in wholesale lots for early delivery. Ferrocarbon-titanium, 15 to 18 per cent, is selling at $200 per net ton in carload lots, at $220 per ton in lots between one ton and a carload, and at $250 per ton in lots less than a ton, f.o.b. Suspension Bridge, N. Y.

Finished Iron and Steel.—Buying is confined to relatively small amounts, with some export business included, and prices are holding firm. Several hundred-ton lots of plates have been moved at the prevailing price of 2.65c., Pittsburgh, including about 100 tons for Japan. The only irregular note is a quotation of between 2.25c. and 2.30c., base, to a domestic consumer on about 80 tons of marine boiler steel. Japan is said to be in the market for 10,000 tons of 70-lb. rails and a separate inquiry for 800 tons of 60-lb. rails for the same country is noted. Noteworthy activity is mentioned in tanks for oil companies. No sizable structural jobs were closed this week, but on some of the recent awards at least the fabricators were given the protection of any drop in price up to the time of shipment of the material. Of the week's awards for fabricated structures may be mentioned 1100 tons for a fertilizer storehouse for Armour & Co., Chicago, placed with the Milwaukee Structural Steel Co., and several hundred to be supplied by the Bethlehem Steel Co. for the 167th Street telephone exchange. Bids are asked for two theaters, one in Wikes-Barre, Pa., 200 tons, and another in Albany, N. Y., 275 tons; the Lehigh Valley and Pennsylvania railroads are each in the market for 150 tons of steel work and an apartment is up for figures in Baltimore involving 250 tons. The Rondout bridge for New York State, taking 1000 tons, has been postponed. We quote mill shipments as follows: Bar iron, refined grade, 2.62c.; double refined bar iron, 3.62c.; soft steel bars, 2.62c.; shapes, 2.72c.; plates, 2.92c., all New York. Small lots of standard section steel rails sell at $49 per gross ton for Bessemer product and $51 per ton for the open hearth product.

Warehouse Business.—Jobbers are all optimistic that the business world is about ready to acknowledge that economic conditions do not warrant any further price reduction, with the result that they generally predict a steady and satisfactory increase in business over the next six or eight weeks. Little or nothing, however, is being done at present. A warehousing differential of 75c. per 100 lb. has now received general acceptance as regards blue annealed and black sheets. This amounts to a reduction of $2.50 a net ton for black sheets, and eliminates a slight range current on blue annealed. Galvanized sheet is

ports that lower prices are being made but this cannot be verified. One producer of plates reports inquiry for a considerable tonnage of tank plates during the week.

Steel bars, 3.45c.; iron bars, 4.15c.; shapes, 3.55c.; plates, 3.75c.; No. 10 blue annealed sheets, 4.65c.; No. 28 black, 5.70c.; No. 28 galvanized sheets, 7.05c.

St. Louis

ST. LOUIS, April 28.

Pig Iron.—The situation in the pig iron market shows very little change, and while there is some buying of small lots being put through, it is for immediate or special needs. At the same time there is some little indication of inquiry for last half delivery and there is a feeling that if some adjustment could be reached in connection with the attitude of the Railroad Administration there would be a disposition to buy more freely. The melters, however, are in a somewhat independent frame of mind because of the iron in their yards or under contract.

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Soft steel bars, 3.44c.; iron bars, 3.44c.; structural material, 3.54c.; tank plates, 3.74c.; No. 8 blue annealed sheets, 4.59c.; No. 10 blue annealed sheets, 4.64c.; No. 28 black sheets, cold rolled, one pass, 5.44c.; No. 28 galvanized sheets, black sheet gage, 6.79c.

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	Per Gross Ton	
Old iron rails	$22.00 to	$23.00
Old steel rails, rerolling	17.25 to	17.75
Old steel rails, less than 3 ft.	16.50 to	17.00
Relaying rails, standard sections, subject to inspection	40.00 to	45.00
Old carwheels	22.00 to	22.50
No. 1 railroad heavy melting steel	15.00 to	15.50
Heavy shoveling steel	14.00 to	14.50
Ordinary shoveling steel	13.00 to	13.50
Frogs, switches and guards, cut apart	15.50 to	16.00
Ordinary bundled sheets, scrap	9.00 to	9.50
Heavy axle and tire turnings	9.00 to	9.50
Per Net Ton		
Iron angle bars	$16.00 to	$16.50
Steel angle bars	14.50 to	15.00
Iron car axles	26.00 to	26.50
Steel car axles	21.50 to	22.00
Wrought arch bars and transoms	19.00 to	19.50
No. 1 railroad wrought	16.00 to	16.50
No. 2 railroad wrought	14.00 to	14.50
Railroad springs	15.00 to	15.50
Steel couplers and knuckles	15.00 to	15.50
Locomotive tires, 42 in. and over, smooth inside	14.50 to	15.00
No. 1 dealers' forge	11.50 to	12.00
Cast iron borings	7.50 to	8.00
No. 1 busheling	13.50 to	14.00
No. 1 boiler cut to sheets and rings	11.00 to	11.50
No. 1 railroad cast	20.00 to	20.50
Stove plate and light cast	15.50 to	16.00
Railroad malleable	13.50 to	14.00
Pipes and flues	11.00 to	11.50
Heavy railroad sheet and tank	10.00 to	10.50
Railroad grate bars	12.00 to	12.50
Machine shop turnings	6.50 to	7.00
Country mixed	11.00 to	11.50
Uncut railroad mixed	12.50 to	13.00
Horseshoes	14.50 to	15.00

Birmingham

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Foundry, 1.75 to 2.25 silicon	$26.75
Basic	25.75

Cast-Iron Pipe.—The cast-iron pipe trade improves slightly each week, but there is an obstinate perseverance in purchasing only for immediate and pressing needs. Sanitary pipe brokers order only on sales previously made by them and water pipe is taken only in such quantities as must be had right now. The leading interest is interesting itself in castings for sugar-house machinery, with which this district has long supplied Cuba, Porto Rico, Louisiana and Mexico.

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Old Material.—The market remains dull except as to cast scrap, which continues to change hands in considerable quantities. There has been a slight increase in the demand for heavy melting steel. We quote per gross ton f.o.b. Birmingham district yards prices to consumers as follows:

Steel rails	$10.50 to $11.00
No. 1 heavy steel	11.00 to 12.00
Cast iron borings	6.00 to 6.50
Machine shop turnings	6.00 to 6.50
Stove plate	13.00 to 13.50
No. 1 cast	19.00 to 19.50
Car wheels	19.00 to 19.50
Tramcar wheels	18.00 to 18.50
Steel axles	17.00 to 18.00
No. 1 wrought	12.00 to 13.00

San Francisco

SAN FRANCISCO, April 22.

The labor situation on the Coast has by no means yet reached permanent settlement. The Iron Trades Council has sent notice to the Metal Trades Association declaring that the agreements of Jan. 2, 1918, and of Jan. 20, 1919, are no longer agreeable to the council. This means that the plants are now being operated without any form of agreement. At the last meeting of the Iron Trades Council evidence was introduced which tended to show that about 40 of the 250 operating engineers at the Union and Alameda plants of the Bethlehem Shipbuilding Corporation were not receiving the scale of $6.40 per day. Authority to strike was given, and the two plants may be tied up if adjustment is not immediately made.

The iron and steel trade in general is still waiting. At present the dispute between the Railroad Administration and the Industrial Board over the just price

to charge for materials is holding up buying. Notwithstanding this, there is more life in reinforcing bars and in pipe than for some time. The latter promises to show further developments, as there is a good prospect of considerable export business. Several tons of brass valves were recently shipped to Java, and this is construed to mean that a demand for pipe will follow.

Finished Material.—The market for bars is better than for some time, and this is attributed to the fact that there is considerable building of concrete structures in the interior. There is practically no demand for structurals, as most of the buildings going up in the State do not need large shapes. Early in the fall the Bank of Italy is to erect a large steel-frame building at Powell and Market streets. But this is the only important job of its kind in sight at the present time.

Wrought Pipe.—Inquiry for wrought pipe continues brisk, but no sales of importance are reported. The supervisors of Kern County are figuring on spending $25,800 on steel pipe in connection with the Oildale Waterworks System.

Cast-Iron Pipe.—The demand for cast-iron pipe is showing considerable improvement, and it is evident that the users have decided to wait no longer for lower rates. Bellingham, Wash., received bids April 17 on 200 tons of 18-in. and 24-in. pipe, and rejected them. It is now calling for new bids to be opened April 24. Alhambra has received bids for 4, 6, 8 and 14-in. pipe, and recently awarded the contract to the American Cast Iron Pipe & Foundry Co.

Pig Iron.—Fill-in orders on pig iron made up the bulk of sales on the Coast. There is no business of size in sight.

Old Materials.—The big mills are seemingly making an effort to force down the price of scrap still further. There is practically no scrap coming into this market at present, but the demand is so light that no one is suffering for material. While no quotations are obtainable for scrap, the general feeling is one of weakness.

New York

NEW YORK, April 29.

Pig Iron.—A new export freight rate on pig iron from Pittsburgh to the Pacific Coast has been announced, it being 55c. per 100 lb., compared with the recent rate of 75c. Exporters are glad to see the tendency to reduce freight rates to help in the export business, but it is possible to ship pig iron from Pittsburgh to Japan or China via Atlantic ports at present for about $23.90 and with the new rate from Pittsburgh to the Pacific Coast the rate from Pittsburgh to Japan or China by that route will be about $25.60; hence the new rate is not likely to start any movement from Pittsburgh to the Pacific Coast. Owing to the advances in the price of pig iron in England and the downward tendency of ocean freight rates, interest in exports is more active and some exporting is being quietly done. The domestic market is extremely quiet and foundries are buying only very small tonnages. We quote as follows, delivered New York, for Northern and Southern grades:

No. 1 foundry, silicon, 2.75 to 3.25	$31.55
No. 2 X, silicon, 2.25 to 2.75	29.80
No. 2 plain, silicon, 1.75 to 2.25	28.55
No. 2 X, Virginia, silicon, 2.25 to 2.75,	$31.90 to 32.40
No. 1 Southern, silicon, 2.75 to 3.25	37.45
No. 2 Southern, soft (all rail), sil. 2.25 to 2.75.	35.70
No. 2 Southern (all rail), sil., 1.75 to 2.25	34.45

Ferroalloys.—Demand for ferromanganese continues light with transactions still limited to carload lots, most of which are reported to have been resale material at $110, delivered. Producers continue to quote $150, delivered, for 78 to 82 per cent alloy with $2 deducted for each unit below 78 per cent. Imports of ferromanganese for March were 5741 tons, making the total for the first quarter 9211 tons, which is in excess of 3000 tons more than was imported in the same quarter a year ago. The spiegeleisen market is extremely inactive and in the absence of transactions is extremely inactive and in the absence of transactions of any consequence it is believed that 16 to 19 per cent alloy could be obtained at about $37.50 delivered. We quote the market nominal at $37.50 to $42 delivered. Imports of manganese ore continue very heavy, those for March having been 48,238 gross tons, making the total for the first quarter of this year 115,221 tons or only about 3000 tons less than those for the same quarter a year ago. No transactions in manganese ore have been heard of recently, the latest offering having been 55c. per unit for Indian ore at the seaboard. The market for ferrosilicon, 50 per cent, is extremely dull with material for spot or forward delivery quoted at $90, delivered, but it is understood that there is still considerable resale material available at lower prices. Some export business has been done in 50 per cent ferrosilicon as well as in the electric 15 per cent grade, which is quoted at $55, delivered, for domestic consumption. Quotations for ferrotungsten are difficult to obtain in the absence of any real test of the market but it is believed that the alloy can be secured at around $1 to $1.25 per lb. contained tungsten. Ferrochrome, 60 to 70 per cent, carload lots, is nominal at 32c. to 34c. per lb. of contained chromium, depending on carbon content. In small lots 2c. per lb. more is added. Ferrochrome, carbon free, 60 per cent chromium, is obtainable at 70c. per lb. of alloy. Ferrovanadium is quoted at $6 per lb. of contained vanadium in wholesale lots for early delivery. Ferrocarbon-titanium, 15 to 18 per cent, is selling at $200 per net ton in carload lots, at $220 per ton in lots between one ton and a carload, and at $250 per ton in lots less than a ton, f.o.b. Suspension Bridge, N. Y.

Finished Iron and Steel.—Buying is confined to relatively small amounts, with some export business included, and prices are holding firm. Several hundred-ton lots of plates have been moved at the prevailing price of 2.65c., Pittsburgh, including about 100 tons for Japan. The only irregular note is a quotation of between 2.25c. and 2.30c., base, to a domestic consumer on about 80 tons of marine boiler steel. Japan is said to be in the market for 10,000 tons of 70-lb. rails and a separate inquiry for 800 tons of 60-lb. rails for the same country is noted. Noteworthy activity is mentioned in tanks for oil companies. No sizable structural jobs were closed this week, but on some of the recent awards at least the fabricators were given the protection of any drop in price up to the time of shipment of the material. Of the week's awards for fabricated structures may be mentioned 1100 tons for a fertilizer storehouse for Armour & Co., Chicago, placed with the Milwaukee Structural Steel Co., and several hundred to be supplied by the Bethlehem Steel Co. for the 167th Street telephone exchange. Bids are asked for two theaters, one in Wikes-Barre, Pa., 200 tons, and another in Albany, N. Y., 275 tons; the Lehigh Valley and Pennsylvania railroads are each in the market for 150 tons of steel work and an apartment is up for figures in Baltimore involving 250 tons. The Rondout bridge for New York State, taking 1000 tons, has been postponed. We quote mill shipments as follows: Bar iron, refined grade, 2.62c.; double refined bar iron, 3.62c.; soft steel bars, 2.62c.; shapes, 2.72c.; plates, 2.92c., all New York. Small lots of standard section steel rails sell at $49 per gross ton for Bessemer product and $51 per ton for the open hearth product.

Warehouse Business.—Jobbers are all optimistic that the business world is about ready to acknowledge that economic conditions do not warrant any further price reduction, with the result that they generally predict a steady and satisfactory increase in business over the next six or eight weeks. Little or nothing, however, is being done at present. A warehousing differential of 75c. per 100 lb. has now received general acceptance as regards blue annealed and black sheets. This amounts to a reduction of $2.50 a net ton for black sheets, and eliminates a slight range current on blue annealed. Galvanized sheet is

still pegged at 6.50c. under the influence of a prominent interest, which is reported willing to shade its own list price, 6.72c., to this extent. Quotations on steel wire out of store have been cut 25c. per 100 lb. There is nothing new in steel for construction, jobbers holding varying views as to whether or not a slight swing either up or down has materialized the past week. Low-carbon Bessemer rods for screw stock are quoted net list; but quantities of resale stock of S.A.E. specification are offered at 5 to 10 off list. The only business from jobbers to the mills is for special shapes or sizes. In most cases shipments on these are not guaranteed by the mills prior to 4 or 6 weeks, for the reason that orders sufficient to make a minimum rolling, about 200 tons, cannot be accumulated in less time as business goes. Out-of-store prices are: No. 10 blue annealed sheets, 4.57c.; No. 28 black sheets, 5.37c.; No. 28 galvanized sheets, 6.50c.; steel bars, 3.37c.; structural shapes, 3.47c.; plates, 3.67c.; bands, 3/16 in., Nos. 10 and 12. 4.07c.; shafting, net list.

Cast Iron Pipe.—There is some increase in inquiries from contractors and manufacturing companies, but the market is weak, and when even a fair tonnage is offered, concessions are freely made. This was true on a recent bidding on 1500 tons for Bayonne, N. J., the contractor shading the usual quotations about $4 per ton. New York nominal quotations are as follows: 6-in. and heavier, $57.70; 4-in., $60.70; 3-in. $67.70, and $1 additional for class A and gas pipe.

Old Material.—The tendency of prices is downward, though very little actual change from last week is noted. There has been some inquiry for rerolling rails; also for car wheels for export for $24. A weakness in turnings results from the glut of this article in the Pittsburgh district. A large majority of sales are forced, which does not help the tone of the market. Brokers and dealers call attention to the fact that the mills are suffering from a dearth of orders and it is not known what effect the sale of Government scrap will have—whether it can be absorbed by the dealers or not. Brokers' and dealers' buying prices, New York, follow:

Heavy melting steel	$11.50 to $12.00
Rerolling rails	14.50 to 15.00
Relaying rails, nominal	38.00 to 40.00
Steel car axles	19.00 to 20.00
Iron car axles	24.00 to 25.00
No. 1 railroad wrought	18.50 to 19.50
Wrought iron track	13.50 to 14.50
Forge fire	7.50 to 8.00
No. 1 yard wrought, long	15.00 to 15.50
Light iron	5.50 to 6.00
Cast borings (clean)	9.00 to 9.50
Machine shop turnings	8.00 to 8.50
Mixed borings and turnings	7.50 to 8.00
Iron and steel pipe (1 in. minimum diameter), not under 2 ft. long	14.00 to 15.00
Stove plate	15.50 to 16.50
Locomotive grate bars	15.00 to 15.50
Malleable cast (railroad)	12.50 to 13.50
Old carwheels	20.00 to 20.50

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, are:

No. 1 machinery cast	$21.00 to $22.00
No. 1 heavy cast (columns, building materials, etc.), cupola size	20.00 to 21.00
No. 1 heavy cast, not cupola size	14.50 to 15.00
No. 2 cast (radiators, cast boilers, etc.)	17.00 to 17.50

Cincinnati

CINCINNATI, O., April 29—(*By Wire*).

Pig Iron.—Some Northern malleable is being bought for prompt delivery, and a sale of 1000 tons was made last week for shipment during May. Odd lots of foundry and high silicon irons are also being disposed of, all of which iron is for delivery before July 1. A prominent sanitary manufacturing company is expected to close this week for 1000 tons of Southern foundry to be delivered at Louisville within the next 60 days. Small tentative inquiries are out for some third quarter iron, but consumers are very slow in closing. Southern iron from some interests can be bought for prompt shipment below $26.75, Birmingham basis, but very little has been sold in this immediate vicinity. Several of the Tennessee furnaces which have an advantage in freight rates over Birmingham proper have now ceased to use Birmingham as a basing point. The absence of transactions and open offers prevents making a change in quotations, but it is generally recognized that if the South is to compete in this market with Northern furnaces a downward revision is necessary except in cases where special irons are required. So far, southern Ohio furnaces are said to be adhering to the schedule price, but they are taking on very little business. Ohio silvery irons are firm at $40.25 for 8 per cent. analysis, and no information is at hand indicating that this figure has been shaded. More furnaces in the South are to blow out, although only seven are now engaged in making foundry iron. Virginia makers are not disposed to push sales for future shipment and they are also now somewhat lukewarm in meeting Northern competition at many points where the freight rate is against them. The general apathy of buyers does not promise any early change in the situation. Late information indicates that no more furnaces in southern Ohio will shut down soon, but the absence of a demand for iron may cause this action on their part because of the unwillingness to pile at present costs.

Based on freight rates of $3.60 from Birmingham and $1.80 from Ironton, we quote, f.o.b. Cincinnati:

Southern coke, silicon 1.75 to 2.25 (base price)	$30.35
Southern coke, silicon 2.25 to 2.75 (No. 2 soft)	31.60
Southern gray forge	29.35
Ohio silvery, 8 per cent silicon	42.05
Southern Ohio coke, silicon 1.75 to 2.25 (No. 2)	28.75
Basic, Northern	27.55
Standard Southern carwheel	51.60

Coke.—A little more furnace and foundry coke is being sold for prompt shipment. It is reported that a few consumers of both grades are feeling out the market for their last half requirements, but they are not now inclined to place contracts. The blowing out of so many iron furnaces in different districts has caused a curtailment in the production of furnace coke in the different fields. Connellsville furnace coke is quoted around $3.75 to $4 and foundry coke from $4.75 to $5.50. Some special brands are held at a higher figure than the one last named. Wise County and Pocahontas 48-hr. coke remains at $4.75 to $5, and foundry coke from $6 to $6.50 per net ton at oven. New River operators seem to be indifferent about taking on any more future business and are quoting foundry coke at $7.50 to $8 per net ton at oven.

Fluorspar.—There is no change in the situation and business is quite light, although there are no further cancellations reported lately of old contracts. Washed gravel fluorspar is quoted at point of shipment from $25 to $30 per ton.

Finished Material.—Business has slowed down to the point where jobbers are selling only limited quantities. No one seems to want to be caught with any large amount of material on hand after July 1. About the only orders being placed with the mills now for future shipment are for special material, and these orders are few in number. The galvanized sheet situation shows a little improvement, as sheet metal contractors are fairly busy at the present time notwithstanding the fact that building operations are at a low water mark. Some pressure has been brought to bear on the mills to guarantee prices against decline, but this move has not been successful.

The following are present local jobbers' prices: Steel and iron bars, 3.33c. base; bands, 4.03c. base; structural shapes, 3.43c. base; plates, ¼-in. and heavier, 3.63c. base; No. 10 blue annealed sheets, 4.53c., and wire nails, $3.85 per keg base.

High Speed Steel.—Standard brands of high speed steel are still quoted at $1.70 per lb. base, but other brands may be obtained at a lower figure. Business is only fair.

Old Material.—Some steel scrap of different kinds has been sold within the past few days for prompt shipment to the Pittsburgh-Youngstown district. The local and nearby foundries are buying practically no scrap, as all of them have a sufficient amount in their yards to carry them to July 1, and later, at the present rate of consumption. Cast iron borings have lately been pur-

chased heavily by a melter near Pittsburgh, but there is a limited demand for steel turnings. The following are dealers' prices in carload lots, f.o.b. yards Southern Ohio and Cincinnati:

Per Gross Ton	
Bundled sheet	$9.50 to $10.00
Old iron rails	22.50 to 23.00
Relaying rails, 50 lb. and up	40.00 to 41.00
Rerolling steel rails	14.00 to 14.50
Heavy melting steel	13.00 to 13.50
Steel rails for melting	13.00 to 13.50
Old carwheels	15.50 to 16.00
No. 1 railroad wrought	14.00 to 14.50
Per Net Ton	
Cast borings	$6.00 to $6.50
Steel turnings	5.50 to 6.00
Railroad cast	15.50 to 16.00
No. 1 machinery	17.00 to 17.50
Burnt scrap	11.00 to 11.50
Iron axles	23.00 to 23.50
Locomotive tires (smooth inside)	14.00 to 14.50
Pipes and flues	10.50 to 11.00
Malleable cast	11.00 to 11.50
Railroad tank and sheet	9.00 to 9.50

IRON AND INDUSTRIAL STOCKS

No Appreciable Market Trend Anticipating Action on Steel Corporation Shares

NEW YORK, April 29.

Steel company shares were practically marking time the past week, waiting on the action of the Steel Corporation directors on dividend payments; and changes in industrials are generally without definite direction except for a spectacular bull movement in oil and railway stocks with oil properties.

The range of prices in active iron and industrial stocks from Tuesday of last week to Wednesday of this week was as follows:

Allis-Chalm. com.	37¼- 39½	La Belle Iron c..	99 - 99½
Allis-Chalm. pf..	94 - 95	Lackaw. Steel ..	70½- 72¾
Am. Can com...	51¾- 54¾	Lake Supr. Corp.	19¾- 20⅝
Am. Can pf.	102¼	Midvale Steel ..	45¼- 47⅛
Am. Car & F. c..	94¼- 97⅛	Nat.-Acme	37½- 38½
Am. Car & F. pf.	116½-117	Nat. En. & St. c..	59¾- 61
Am. Loco. com...	70½ 78	Nat. En. & St. pf.	100
Am. Loco. pf....	104 -104⅛	N. Y. Air Brake.	109 -112
Am. Radiator c.	275	Nova Scotia Steel	50½- 62
Am. Ship com...	117½-119	Pressed Steel c..	73½- 76¼
Am. Steel Fdries.	93¾- 99¾	Ry. Steel Spg. c..	86 - 89
Bald. Loco. com..	90¼- 94¾	Ry. Steel Spg. pf.	103½-107½
Beth. Steel com.	74 - 76¾	Republic com. ..	81½- 82⅞
Beth. Steel cl. B.	74⅜- 77⅜	Republic pf.	103⅞
Cons. J. L. pf...	97 - 98	Sloss com.	53 - 55¾
Ohio Thom. Tool.	66 - 67	Sloss pf.	86
Ohio Fuel	42¾- 44⅛	Superior Steel ..	38¼- 39¾
Crue. Steel com..	67⅜- 72⅞	Transue-Williams	46½- 48
Crue. Steel pf...	93¼- 94½	Un. Alloy Steel..	45½- 46½
Deere & Co. pf..	96½- 98	U. S. Pipe com..	24¾- 26⅞
Gen. Electric ...	160 -163¾	U. S. Pipe pf....	62 - 65
Gt. No. Ore Cert.	42⅞- 45¼	U. S. Steel com..	99¼-102
Gulf States Steel.	53½- 54⅜	U. S. Steel pf....	116½-117¼
Int. Har. com...	131¾-135⅝	Va. I., C. & Coke.	57 - 60
Int. Har. pf.....	114⅜-116¾	Westingh. Elec..	48⅝- 51⅞

Dividends

The American Brass Co., quarterly, 1½ per cent and extra 1½ per cent, payable May 15.

The Atlantic Steel Co., 3½ per cent on the preferred, payable May 1.

The Bethlehem Steel Co., quarterly, 1¼ and extra ¾ per cent on the common, 1¼ and extra ¾ per cent on common B, 1¾ per cent on the non-cumulative preferred and 2 per cent on the cumulative convertible preferred, all payable July 1.

The Canada Foundries & Forgings, Ltd., quarterly, 3 per cent on the common and 1¾ per cent on the preferred, payable May 15.

The Harbison-Walker Refractories Co., quarterly, 1½ per cent on the common, payable July 2 and 1½ per cent on the preferred, payable July 19.

The Lima Locomotive Works, Inc., 3½ per cent, payable May 15.

The National Acme Co., quarterly, 1½ per cent, payable May 24.

The Pressed Steel Car Co., quarterly, 2 per cent on the common, payable June 4, and 1¾ per cent on the preferred, payable May 27.

The Stewart-Warner Speedometer Corporation, quarterly, 2 per cent, payable May 15.

The United States Steel Corporation, quarterly, 1¼ per cent on the common, payable June 28, and 1¾ per cent on the preferred, payable May 29.

American Radiator Co.'s Report

According to the 1918 report of the American Radiator Co., the demand for products for civilian purposes was greatly curtailed and the demand for military purposes did not offset this. Among the war items made were 4- and 5-in. caliber naval guns and spare parts, proof projectiles, hand and rifle grenades and various sizes of semi-steel cast shell, in certain classes of which the company was the largest producer. Profits accruing from munitions were small. The combined net profits of the parent and constituent companies in Canada, England, France and Italy were $2,666,300, while the total surpluses were $15,429,323. Of the 800 employees who entered the service, 16 were killed. The company established a department of industrial relations, administering in employment, welfare and group insurance. The cash balance, including United States certificates of indebtedness and Liberty bonds, aggregate $5,022,171.

Industrial Finances

Though net sales of the General Electric Co. were greater by $20,000,000 in 1918 than in the preceding year, the surplus after charges and taxes decreased from $26,903,828 in 1917 to $17,104,982, or per share earned from $26.50 to $14.76. When the armistice was signed, the rate of production had reached the highest point in its history. Cancellation of orders totaled $30,000,000, leaving unfilled orders of $80,000,000 at the year's end. The company borrowed $1,500,000 from the Government to build workmen's homes and increase power and transportation facilities at Erie, Pa., for the production of machinery and apparatus for the Navy. To provide additional facilities for the manufacture of incandescent lamps, the company leased the Sandusky works of the Libbey Glass Co. with contract to purchase.

William Cramp & Sons' Ship & Engine Building Co. reports net earnings of $1,539,095 for eight months, ending Dec. 31, 1918, compared with $1,507,402 for a corresponding period the previous year. The output consisted of torpedo boat destroyers, transports and tankers, total keels laid being 30, boats launched, 28 and boats delivered, 17. The shipyard force numbers 10,200.

The annual report of the Winchester Repeating Arms Co. for 1918 shows surplus after charges and reserves of $1,469,766, over twice the amount of 1917 and a little less than 1916. Gross sales amounted to $61,120,231, more than twice the figures of the two preceding years.

A receiver has been appointed for the Canton Brass Foundry Co., Canton, Ohio, following a suit brought by creditor for $17,118.

C. W. Johnson was named receiver for the Louisville Steel & Iron Co. by Judge Walter Evans of the Federal Court at Louisville, on April 25, following an involuntary petition in bankruptcy field against the company.

The Saginaw Malleable Iron Co., Saginaw, Mich., will increase its capital from $650,000 to $1,150,000 to provide funds for doubling its present capacity.

To house trade associations, of which there are 800 in the country, with 80 per cent having headquarters in New York, plans are being formulated for the construction of a new building west of Fifth Avenue, between Forty-third and Forty-fourth streets, New York, to be known as the National Association Building. Advantages will be its proximity to railroad terminals, subways and elevated roads, thirteen large hotels, six prominent banks and twelve leading clubs. The close grouping of associations of related industries serves to facilitate co-operation. An arcade connecting the two boundary streets will make the ground floor useful for show rooms. Willard C. Brinton, 17 West Forty-fourth Street, New York, is consulting engineer for the project.

The Consolidated Steel Corporation, 165 Broadway, has arranged to act as exclusive export selling agent for tires, steel-tired wheels and other tire mill products of the Railway Steel Spring Co., Standard Steel Works Co., Philadelphia, and the Edgewater Steel Co., Pittsburgh. The Consolidated Steel Corporation is also export agent of the same products for the Midvale Steel & Ordnance Co., Philadelphia, one of its member companies.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight rates from Pittsburgh on finished iron and steel products, including wrought iron and steel pipe, with revisions effective Nov. 1, 1918, in carloads, to points named, per 100 lb., are as follows: New York, 27c.; Philadelphia, 24.5c.; Boston, 30c.; Buffalo, 17c.; Cleveland, 17c.; Cincinnati, 23c.; Indianapolis, 25c.; Chicago, 27c.; St. Louis, 34c.; Kansas City, 59c.; St. Paul, 49½c.; Denver, 99c.; Omaha, 59c.; minimum carload, 36,000 lb. to four last named points; New Orleans, 38.5c; Birmingham, 57.5c.; Pacific Coast, $1.25; minimum carload, 80,000 lb. To the Pacific Coast the rate on steel bars and structural steel is $1.315, minimum carload 40,000 lb.; and $1.25, minimum carload 50,000 lb. On wrought iron and steel pipe the rate from Pittsburgh to Kansas City is 50c. per 100 lb., minimum carload 46,000 lb.; to Omaha, 50c., minimum carload 46,000 lb.; to St. Paul and Minneapolis, 49.5c.; minimum carload 46,000 lb.; Denver, 99c.; minimum carload 46,000 lb. A 3 per cent transportation tax applies. On iron and steel items not noted above, rates vary somewhat and are given in detail in the regular railroad tariffs:

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in. angles, 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees, structural sizes, 2.45c.

Wire Products

Wire nails, $3.25 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of $1.50, and shorter than 1 in., $2.00. Bright basic wire, $3.15 per 100 lb.; annealed fence wire, Nos. 6 to 9, $3.00; galvanized wire, $3.70; galvanized barbed wire and fence staples, $4.10; painted barbed wire, $3.40; polished fence staples, $3.40; cement-coated nails, $2.85 base; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 60½ per cent off list for carload lots, 59½ per cent for 1000-rod lots, and 58½ per cent off for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....$3.70 base
Large boiler rivets.....$3.80
¼ in., 5/16 in. and 7/16 in. diam....65-10 and 5 per cent off list
Machine bolts, h.p. nuts, ⅜ in. x 4 in.:
Smaller and shorter, rolled threads..60-10-5 per cent off list
Cut threads .....60-5 per cent off list
Larger and longer sizes.....50-10 per cent off list
Machine bolts, c.p.c. and t. nuts, ⅜ in. x 4 in.:
Smaller and shorter.....45-10-10 per cent off list
Larger and longer .....40-10-5 per cent off list
Carriage bolts, ⅜ x 6 in.:
Smaller and shorter, rolled threads.....60-5 per cent off list
Cut threads .....50-10-5 per cent off list
Larger and longer sizes.....45-10 per cent off list
Lag bolts .....65-5 per cent off list
Plow bolts, Nos. 1, 2, 3.....60 per cent off list
Hot pressed nuts, sq. blank.....3.25c. per lb. off list
Hot pressed nuts, hex., blank.....3.25c. per lb. off list
Hot pressed nuts, sq. tapped.....3c. per lb. off list
Hot pressed nuts, hex., tapped.....3c. per lb. off list
C.p.c. and t. sq. and hex. nuts, blank.....3.25c. per lb. off list
C.p.c. and t. sq. and hex. nuts, tapped.....3c. per lb. off list
Semi-finished hex. nuts:
⅜ in. and larger.....70-10 per cent off list
9/16 in. and smaller.....80 per cent off list
Stove bolts, in packages .....70-10-10-5 per cent off list
Stove bolts .....2½ per cent extra for bulk
Tire bolts .....60-10-10-5 per cent off list
The above discounts are from March 28, 1919.
All prices carry standard extras. Pittsburgh basis.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, $52; chain rods, $60; screw, rivet and bolt rods and other rods of that character, $60. Prices on high carbon rods are irregular. They range from $65 to $75, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes 9/16 in. x 4½ in. and heavier, and small spikes, per 100 lb., $3.35 in lots of 200 kegs of 200 lb. each or more; track bolts, $4.35 per 100 lb. in car load lots of 200 kegs, or more, and $4.90 in small lots. Boat and barge spikes, $3.85 per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh.

Terne Plate

Prices of terne plate are as follows: 8-lb. coating, 200 lb., $13.80 per package; 8-lb. coating, I. C., $14.10; 12-lb. coating, I. C., $15.80; 15-lb. coating, I. C., $16.80; 20-lb. coating, I. C., $18.05; 25-lb. coating, I. C., $19.30; 30-lb. coating, I. C., $20.30; 35-lb. coating, I. C., $21.30; 40-lb. coating, I. C., $22.30 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars at 2.35c. from mill. Prices on bar iron are 2.35c.

Wrought Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card.

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	50½	24	⅛ and ¼	29½	7½
½	54½	40	⅜	36½	24
¾ to 3	57½	44	½	44½	36½
			¾ to 1½	49	42½

Lap Weld

2	50½	38	1¼	44½	36½
2½ to 6	53½	41	1½	46½	38½
7 to 12	50½	37	2	47½	39½
13 and 14	41	..	2½ to 6	49½	41½
15	38½	..	7 to 12	44½	36½

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	46½	29	⅛, ¼ and ⅜	33½	11½
½	51½	34	½	41½	29½
¾ to 1½	55½	43	¾ to 1½	48½	39½
2 to 3	56½	44			

Lap Weld, extra strong, plain ends

2	48½	37	1¼	42½	34½
2½ to 4	51½	40	1½	44½	36½
4½ to 6	50½	39	2	45½	37½
7 to 8	46½	33	2½ to 4	46½	38½
9 to 12	41½	28	4½ to 6	24½	17½
			7 to 8	20½	13½
			9 to 12	21½	14½

To the large jobbing trade an additional 5 per cent is allowed over the above discounts which are subject to the usual variations in weight of 5 per cent.

On butt and lap weld sizes of black iron pipe, discounts for less than carload lots to jobbers have been seven (7) points lower (higher price) than carload lots, and on butt and lap weld galvanized iron pipe have been nine (9) points lower (higher price).

Boiler Tubes

The following are the prices for carload lots, f.o.b. Pittsburgh:

Lap Welded Steel

2½ to 4½ in.	40½
2½ to 3¼ in.	30½
2¼ in.	24
1¾ to 2 in.	19½

Charcoal Iron

3½ to 4½ in.	—16
3 to 3¼ in.	—11
2½ to 2¾ in.	— 1
2 to 2¼ in.	+10
1¾ to 1⅞ in.	+20

Standard Commercial Seamless—Cold Drawn or Hot Rolled

	Per Net Ton		Per Net Ton
1 in.	$327	1¾ in.	$207
1¼ in.	267	2 to 2½ in.	177
1⅜ in.	257	2¾ to 3¾ in.	167
1½ in.	207	4 in.	187
		4½ to 5 in.	207

These prices do not apply to special specifications for locomotive tubes nor to special specifications for tubes for the Navy Department, which will be subject to special negotiation.

Sheets

Makers' price for mill shipments on sheets of United States standard gage in carload and larger lots are as follows:

Blue Annealed—Bessemer

	Cents per lb.
No. 8 and heavier	3.50
Nos. 9 and 10 (base)	3.55
Nos. 11 and 12	3.60
Nos. 13 and 14	3.65
Nos. 15 and 16	3.75

Box Annealed, One Pass Cold Rolled—Bessemer

Nos. 17 to 21	4.15
Nos. 22 to 24	4.20
Nos. 25 and 26	4.25
No. 27	4.30
No. 28 (base)	4.35
No. 29	4.45
No. 30	4.55

Galvanized, Black Sheet Gage—Bessemer

Nos. 10 and 11	4.70
Nos. 12 and 14	4.80
Nos. 15 and 16	4.95
Nos. 17 to 21	5.10
Nos. 22 to 24	5.25
Nos. 25 and 26	5.40
No. 27	5.55
No. 28 (base)	5.70
No. 29	5.95
No. 30	6.20

Tin-Mill Black Plate—Bessemer

Nos. 15 and 16	4.15
Nos. 17 to 21	4.20
Nos. 22 to 24	4.25
Nos. 25 to 27	4.30
No. 28 (base)	4.35
No. 29	4.40
No. 30	4.40
Nos. 30½ and 31	4.45

Non-Ferrous Metals

The Week's Prices

Cents per Pound for Early Delivery

	Copper, New York		Tin,	Lead		Spelter	
	Lake	Electrolytic	New York	New York	St. Louis	New York	St. Louis
April	15.50	15.25	72.50	4.95	4.70	6.40	6.05
	15.50	15.25	72.50	4.95	4.70	6.40	6.05
	15.50	15.25	72.50	4.95	4.70	6.40	6.05
	15.50	15.25	....	4.95	4.70	6.40	6.05
	15.50	15.25	72.50	4.95	4.70	6.40	6.05
	15.50	15.25	72.50	4.95	4.70	6.37½	6.02½

NEW YORK, April 29.

The general situation is unchanged with demand very light and prices only holding their own. Demand for copper has not increased, but prices have remained stationary. There continues to be no market in tin because of Government control. The lead market is still very quiet with prices unchanged but easy. The spelter market is stagnant in the absence of any demand of consequence. Antimony is unchanged.

New York

Copper.—Consumers see no reason apparently to increase their purchases of copper, and as a consequence the week has been devoid of any buying of consequence. Underlying conditions are regarded as stable, however, and prices have remained practically stationary at 15.25c., New York, for early delivery for electrolytic copper with Lake copper at about 15.50c., New York, at which level some small transactions have been reported. Large producers are firm in maintaining the former quotation for electrolytic copper, while some small producers are offering small quantities at ⅛c. to ¼c. below this level. No activity is looked for until either the peace treaty is signed or the steel price situation has been definitely adjusted. Nothing is heard regarding export demand or sales.

Tin.—There is no domestic market nor can there be as long as present Government restrictions as to imports and sales continue with the price fixed at 72.50c., New York, which we continue to quote as the nominal market. The only interesting fact noted in the last week is the sale of some Straits tin for shipment from abroad at 48.25c., shipment to be made after the import restrictions are removed. Talk has been revived regarding the possibility of the continuance of the import restrictions even after the United States Steel Products Co. has disposed of all its allocated metal. The idea seems to be that the price of 72.50c. will be maintained until nearly all the metal has been consumed. The continuance of such rumors and the lack of definiteness as to the time when restrictions will be removed are disturbing factors in an already unsatisfactory situation. The consensus of opinion in the trade continues to be that import restrictions will be removed either by June 1 or soon after. There have been no arrivals of tin at either Atlantic or Pacific ports thus far this month. Straits tin was quoted in London to-day at £227 per ton.

Lead.—The market is extremely quiet and inclined to be soft with outside quotations 4.95c., New York, or 4.70c., St. Louis, with the leading interest holding at 5c., New York, because some sellers are inclined to be impatient. A slight cut in these prices is regarded, however, as possible, but nothing under 4.95c., New York, has thus far been heard of.

Spelter.—There is no change in the market for prime Western and there has been no improvement in the demand from either galvanizers or brass makers. Under the circumstances quotations have held remarkably well. Sales were made to-day for May delivery at 6.02½c., St. Louis, or 6.37½c., New York, which we quote as the market, but the amount involved was not large. Very little improvement is expected until the steel price situation has been definitely cleared up.

Antimony.—Asiatic grades are quoted at 6.62½c. to 6.87½c., New York, duty paid, with the market very quiet.

Aluminum.—No. 1 virgin metal, 98 to 99 per cent pure, is slightly higher at 31c. to 33c., New York, for early delivery, with demand light.

Old Metals.—The market is very dull and prices are generally unchanged. Dealers' selling prices are nominally as follows:

	Cents per lb.
Copper, heavy and crucible	15.50
Copper, heavy and wire	14.50
Copper, light and bottoms	12.25
Brass, heavy	11.25
Brass, light	7.50
Heavy machine composition	15.00
No. 1 yellow rod brass turnings	8.25
No. 1 red brass or composition turnings	12.00
Lead, heavy	4.50
Lead, tea	3.75
Zinc	5.00

St. Louis

ST. LOUIS, April 28.—The non-ferrous markets have been quiet though the aggregate of business has been steadily improving. Quotations for carlots at the close to-day were: Lead, 4.75c.; spelter, 6.10c. In less than carlots they were: Lead, 5c. to 5.25c.; spelter, 6.50c. to 6.75c.; tin, 72.50c., nominal; copper 16c. to 17c.; antimony, Asiatic, 8.50c. In Joplin there was no activity in ores and the prevailing prices for zinc blende, calamine and lead ore showed little change from the previous week. On miscellaneous scrap metals we quote dealers' buying prices as follows: Light brass, 6.50c.; heavy yellow brass, 9.50c.; heavy red brass, 13c.; heavy copper and copper wire, 13c.; light copper, 10.50c.; lead, 4c.; zinc, 3c.; tea lead, 3c.; pewter, 35c. tinfoil, 40c.; aluminum, 18c.

Chicago

CHICAGO, April 28.—Copper continues quiet, but producers are holding to prices. Tin is dull, with no change in quotations. Lead and spelter are showing but little activity. Antimony, which showed signs of strength a week ago, is still in demand and has advanced. We quote copper at 16c. to 16.50c. for carloads; tin, 72.50c.; lead, 4.80c. to 4.87½c.; spelter, 6.15c. to 6.25c.; antimony, 8.25c. to 8.75c. On old metals we quote copper wire, crucible shapes, 13c.; copper clips, 12.50c.; copper bottoms, 11c.; red brass, 13c.; yellow brass 8c.; lead pipe, 3.50c.; zinc, 4c.; pewter, No. 1, 32c.; tinfoil, 37c. and block tin, 50c., all these being buying prices for less than carload lots.

Cincinnati

CINCINNATI, April 28.—Nearly all prices are firmer, but only block tin pipe has been advanced and is quoted at 1.60c. to 1.65c. Lead is unchanged at 4c. Heavy copper scrap ranges from 13c. to 13.50c. and crucible copper scrap at 13.50c. to 14c. Copper wire, 13.50c. to 14c.; heavy red brass, 13c. to 13.50c., and yellow brass, 8c. to 8.50c.

The incorporation of the Lakeside Metal & Wool Stock Co., Cleveland, has been announced. The company is a successor of Grodin Brothers, dealers in metals and rubbers, and will occupy quarters at Lakeside Avenue and East Thirty-eighth Street, formerly occupied by Grodin Brothers.

The Wilson-Snyder Mfg. Co., Pittsburgh, builder of plate work, pumps and piping equipment, has received a contract from the Atlantic Gulf Oil Corporation for construction in Mexico of three pipe line stations, a sea-loading station and a water station. The plates and other material will be furnished by Pittsburgh mills.

The Republic Creosoting Co., Merchants Bank Building, Indianapolis, has opened additional branch offices at 204 Erie County Bank Building, Buffalo, in charge of George C. Beals, and in Detroit, at 211 Hammond Building.

PERSONAL

Marcus L. Filley has been Eastern sales representative of the Deforest Sheet & Tin Plate Co. of Niles, Ohio, since the mills were built 10 years ago and he has handled the export business, which has consisted of from 50 to 80 per cent of the output of the company. His offices have been at 30 Church Street, New York. As the sale of the company to the Republic Iron & Steel Co. was rather unexpected, Mr. Filley has made no business plans, but will spend the summer as a vacation at Babylon, L. I., and expects to return to the steel business early in the fall. During the war, while a resident of Brooklyn, he rendered valuable service to the Government as a four minute speaker and in organizing the collection of peach stones for use in the manufacture of gas masks.

F. R. Lounsberry, Atlas Crucible Steel Co., Dunkirk, N. Y., addressed the Steel Treating Research Society, Hartford, Conn., April 23 on "The Manufacture of Crucible Tool Steel."

T. W. Holt, formerly superintendent of the shell forging department, Pressed Steel Car Co., Pittsburgh, has resigned to become general manager of the Curtin Supply Co., Chicago. He was given a testimonial dinner by his former business associates.

Lieut. L. E. Wells, U. S. A. R. F., for the past 18 months, connected with the flying corps, has joined the sales and engineering force of Haverstick & Co., Rochester, N. Y.

R. M. Sisk, formerly in the transportation offices of the United States Railroad Administration at Pittsburgh, has resigned to become traffic manager of the Sharpsville Boiler Works, Sharpsville, Pa.

The Chicago Pneumatic Tool Co. announces the election of Allan E. Goodhue as managing director of its English subsidiary, the Consolidated Pneumatic Tool Co., Ltd., whose offices are at 170 Piccadilly, London, and whose plant is in Fraserburg, Scotland. Mr. Goodhue will also be in charge of European sales for the Chicago Pneumatic Tool Co. Mr. Goodhue was for a number of years connected with the sales department of the Midvale Steel Co. and Midvale Steel & Ordnance Co. in Philadelphia, Chicago and Boston, leaving that company in March, 1918, to enter the service of the Government. From that time until Jan. 1, 1919, when he became connected with the Chicago Pneumatic Tool Co., he was assistant manager of the steel and raw material section, Production Division, of the Emergency Fleet Corporation. Mr. Goodhue will sail for England May 13 on the Mauretania.

John F. Vaughan, district supervisor of wood ship construction for the United States Shipping Board, has resigned to return to the profession of consulting engineer, Boston.

Barton L. Little has become the manager of the alloy steel department, La Salle Steel Co., Chicago, effective May 1.

James A. Campbell, president Youngstown Sheet & Tube Co., Youngstown, Ohio, is back at his desk after a vacation at Hot Springs, Ark.

Clyde M. Brooks, formerly secretary Pittsburgh Iron & Steel Foundry Co., Pittsburgh, recently honorably discharged from the military service, has opened offices in the Farmers' Bank Building, Pittsburgh, for the sale of Bessemer and low phosphorus pig iron and ferroalloys. He will represent in the Pittsburgh district the Stewart Iron Co., Ltd., Sharon, Pa., manufacturer of low phosphorus iron. While in the Government service Mr. Brooks had charge of the raw materials branch of the artillery section of the Pittsburgh district ordnance office.

W. W. Tarleton has resigned as purchasing agent and traffic manager of the Southern Manganese Corporation and has identified himself with the Anniston Steel Co., Anniston, Ala., in charge of the salvage division of the sales department, in which capacity he will sell all of the equipment, consisting of woodworking and ironworking machinery, Corliss engines and scrap, recently acquired by the Anniston Steel Co. from the Illinois Car & Equipment Co.

Donald H. Gordon, for several years in the sales department of the Republic Iron & Steel Co., Youngstown, Ohio, has accepted a position in the sales department of the Brier Hill Steel Co., that city.

O. J. H. Hartsuff, superintendent of the Farrell, Pa., plant of the Carnegie Steel Co., has been appointed general superintendent of both the Farrell and Sharon works. George Rigby has been named general superintendent of the Carnegie works in New Castle, Pa. Heretofore the corporation has employed a district superintendent over the plants at New Castle, Farrell and Sharon, but this position has been abolished. The former district superintendent was John S. Oursler. Mr. Hartsuff went to Farrell as successor to F. E. Norris, now superintending the construction of a new steel plant at Lyons, France.

George W. Niedringhaus, St. Louis, formerly vice-president of the National Enameling & Stamping Co., has been elected president of that corporation to fill the vacancy caused by the recent death of President F. W. A. Kieckhefer of Milwaukee. Mr. Niedringhaus is a pioneer in enamelware manufacture.

E. S. Carmen, secretary and chief engineer Cleveland Osborn Mfg. Co., Cleveland, has been nominated president of the Cleveland Engineering Society, and will be formally elected at the annual meeting. Mr. Carmen, who recently accompanied a party of members of the Cleveland Chamber of Commerce on a trip to Europe, will remain abroad until about June 1. The other members of the party returned home last week.

E. H. Ford, for a number of years representative of the Youngstown Sheet & Tube Co., Youngstown, Ohio, in London, England, has returned to Youngstown. His work has been taken over by the Consolidated Steel Corporation.

The following were elected directors at the annual meeting of the stockholders of the Lackawanna Steel Co.; Cornelius Vanderbilt, Adrian Iselin, B. S. Guinness, H. G. Dalton, W. V. Thorne and J. J. Mitchell.

J. Kearsley Mitchell, who retired from the board of directors of William Cramp & Sons' Ship & Engine Building Co. early in the war, has been again elected to membership to take the place of Harry W. Hand, former president.

Lew E. Wallace and P. O. Eisenbeis, who recently returned from active service, and A. H. Bennell of the sales department of the general offices of the Youngstown Sheet & Tube Co., Youngstown, Ohio, have received promotions. Mr. Wallace has been placed in the Chicago office, as assistant to F. A. Lathrop, general sales manager; Mr. Eisenbeis in the St. Louis office, as assistant to H. L. Miller, manager of sales; and Mr. Bennell in the Cleveland office, as assistant to G. G. Stuart, general sales manager.

The Silvex Co., Bethlehem, Pa., manufacturer of the Bethlehem spark plug, has appointed as its export sales manager in New York H. T. Hutchinson, for the past two years assistant sales manager. Arthur W. Bodin of Allentown, Pa., who has just resigned from the company's department of aircraft product, has been named sales executive, and A. D. Williams, Allentown, on May 1 will assume complete charge of the sales force operating in the Eastern section of the United States.

E. S. Yarnelle, formerly vice-president American Horseshoe Co., Phillipsburg, N. J., has been elected president, succeeding the late Philip S. Dyer.

W. V. S. Thorne has been elected a director of the Lackawanna Steel Co. to fill the vacancy on the board of that corporation caused by the resignation of E. A. S. Clarke, former president of the Lackawanna company, but now head of the Consolidated Steel Corporation.

Foreign representatives of Joseph T. Ryerson & Son, Chicago, have been moving about as follows: Marcel E. Cartier recently sailed for France on the New Amsterdam after a few weeks' visit in this country. John H. Romann sailed for France on the La Touraine April 1, and both Messrs. Romann and Cartier will make their headquarters in Paris to look after interests in France.

Belgium, Holland, Switzerland, Italy, Spain and Portugal. Paul H. Schatzmann sailed for Rio de Janeiro April 10 to temporarily take care of the company interests in Brazil, Argentina and Peru. About August Mr. Schatzmann will sail for Europe, thence to India, China and Japan, via the Suez Canal. A. L. G. Gentles will establish his headquarters in London, to take care of interests in Great Britain and Scandinavia and will sail about the end of May.

George P. Early, special claim agent of the American Sheet & Tin Plate Co., Pittsburgh, delivered an address recently before the member of the Pittsburgh Association of Credit Men on the subject of "Humor."

William S. Dickson, formerly general manager of the Greaves-Klusman Tool Co., Cincinnati, has been appointed manager of the Cleveland branch of William K. Stamets, Pittsburgh.

Harry S. Lewis, formerly in the sales department of the Reilly-Peabody Fuel Co., Frick Building, Pittsburgh, has resigned to become manager of sales of the International Coal Corporation, offices in the same building.

R. T. Armstrong, general manager Flint, Mich., spring plant of the Standard Parts Co., and Edward A. Petrequin, president Petrequin Paper Co., Cleveland, have been elected directors of the Standard Parts Co., Cleveland, succeeding A. H. Goss and E. W. Farr, who resigned during the year.

Stewart Johnson, president Pittsburgh Steel Foundry, and Biddle Arthurs, treasurer Simonds Mfg. Co., both of Pittsburgh, have been elected directors of the Real Estate Trust Co. of that city.

H. W. Dow, sales manager Nordberg Mfg. Co., Milwaukee, who recently returned from a business investigating tour of England, Belgium and France, described his experience before the Foreign Trade Division, Milwaukee Association of Commerce, on Tuesday evening, April 22.

Four representatives of the American Steel Export Co. have arrived in New York: C. S. Vought, who has spent more than a year in France and Italy and has established offices in Paris and Milan. F. H. Tackaberry, who covered both east and west coasts of South America, creating new agencies in Brazil, Argentina, Paraguay, Uruguay and Chile. P. R. Fisher, the company's special engineering representative, who has been on a special mission to Japan for more than a year. W. H. Gilhoff, the company's agent for Norway, Sweden and the Netherlands, who has just completed a trip through the Straits Settlements and Dutch East Indies.

The Blaw-Knox Co., Pittsburgh, manufacturer of steel products, has appointed J. E. Mason manager of field sales, in which capacity he will supervise the operation of a wide sales agency plan throughout the country. Mr. Mason is a graduate of the civil engineering school of Purdue University. For the past four years he has been connected with the McGraw-Hill Publishing Co., and since July, 1917, has been in charge of the Chicago office of the *Engineering News-Record*.

H. E. Streeter, who has represented the Swedish Gage Co. in Canada for the past seven years, is resigning from the company. The Montreal office will be closed and a new office will be opened in Toronto, Ont., to be in charge of M. J. Horsey, late of the Imperial Munitions Board.

E. K. Ruth, assistant professor of the department of civil engineering, University of Cincinnati, has been elected president of the Cincinnati Chapter of the American Association of Engineers. C. S. Carroll, college of civil engineering, University of Cincinnati, is treasurer.

Charles Piez, director general of the Emergency Fleet Corporation, who has resigned to return to the duties of president of the Link-Belt Co., Chicago and Philadelphia, and nine other officials of the Emergency Fleet Corporation, who have also resigned, were guests of honor of employees of the organization Tuesday night at a banquet at the Ritz-Carlton Hotel, Philadelphia. In addition to Mr. Piez, those who have resigned are Howard Coonley, vice-president in charge of administration, who returns to the presidency of the Walworth Mfg. Co., Boston; Admiral H. H. Rousseau, head of the shipyard plants division; Charles F. Wallace, assistant to the director general; Daniel H. Cox, head of the ship construction division; Gordon Wilson, general auditor; R. W. Leatherbee, head of the industrial relations division; M. F. Ferris, head of the contract division, and A. E. Pfeiffer, manager of the supply division. Another dinner was given in Philadelphia on Wednesday evening for Mr. Piez by the Atlantic Coast Shipbuilders' Association. On his return to Chicago Mr. Piez will be the guest of honor at a banquet to be given by the Illinois Manufacturers' Association.

Charles Lundgren, formerly general master mechanic of the National Tube Co. mills at Lorain, Ohio, has resigned to accept a similar position with the new wire mills of the Tennessee Coal, Iron & Railroad Co., Fairfield, Ala.

Corporal W. H. Hundt, 305th Field Artillery, 77th Division, landed in this country Tuesday on the Agamemnon after a year and a half in the service. Upon his discharge he will resume employment with Luria Bros., iron and steel scrap brokers, Woolworth Building, New York. He fought at Chateau-Thierry and other battles.

Frank J. Tone has been made president of the Carborundum Co. of Niagara Falls, N. Y., succeeding the late Frank W. Haskell. George R. Rayner has been made vice-president, succeeding R. B. Mellon, Pittsburgh. F. H. Manley retains the office of treasurer.

Charles H. Gockeler, Steel & Iron Products Co., will shortly move his offices from the fourth floor to the 15th floor of the Hudson Terminal Building at 30 Church Street, New York.

OBITUARY

WILLIAM A. EARLY, recently appointed auditor of the Jones & Laughlin Steel Co., Pittsburgh, died after a brief illness at Atlantic City, on Tuesday, April 22. His home was in the East End, Pittsburgh. Mr. Early had been connected with Jones & Laughlin Steel Co. in various capacities for 38 years, having been steadily promoted from one position to another. Before being appointed auditor he was chief clerk and paymaster at the Pittsburgh works.

WM. A. EARLY

W. H. GRANT, president Bonniwell-Calvin Iron Co., Kansas City, first vice-president American Iron, Steel and Heavy Hardware Association, and chairman of the executive board, died Thursday, April 10, aged 64 years.

William P. Starkey, vice-president and general manager Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa., will present a handsome new pipe organ to the Harrisburg Grace Methodist Church as a memorial to the church's 70 members who served with the United States forces during the war.

FREDERICK ROBINSON, for many years vice-president and general manager J. I. Case Threshing Machine Co., Racine, Wis., died April 22, after a long illness. He was born in Kenosha, Wis., on Nov. 15, 1862.

WILLIAM ANDREWS, a mechanical and construction engineer and formerly president of the Andrews Engineering Co., New York, died April 19 at his home, Brooklyn, in his seventy-seventh year.

GEORGE H. PHILLIPS, president Hewes & Phillips Iron works, Newark, N. J., died April 23 at his summer home in Brielle, N. J., at the age of 66.

Machinery Markets and News of the Works

MORE PRICE REDUCTIONS

Several Builders of Machine Tools Make Substantial Cuts

Tendency of Buyers Is to Hold Off and Business is Generally Dull—British Embargo Lifted

Following the recent reductions approximating 20 per cent on lathes, other tool manufacturers have announced lower prices. Radial drills have come down about 10 per cent, a number of builders of milling machines have reduced prices from 10 to 20 per cent and one upright drill manufacturer has made a cut of 15 per cent. On cutter and tool grinders prices have been cut 20 per cent. A slight improvement in the demand for lathes is noted as a result of the lower prices, but as a general rule reduced prices have not stimulated business. Quite a number of manufacturers of standard tools continue to assert that their prices will not be reduced, and one builder, at least, has gone so far as to guarantee prices until the end of this year and asserts that there will be positively no reduction on its tools within that time.

In the Chicago district, and to a certain degree in Detroit and in Cleveland, there is a fair amount of business, but taken as a whole, machine tool trade throughout the country is extremely quiet. The tendency among buyers to hold off is more pronounced than at any time this year. April business is below that of March. Expectations of lower prices and a feeling that some "bargains" may be picked up from among the second-hand war tools to be disposed of by the War Department are the principal factors contributing to the present state of dullness. Indicative of the attitude of many buyers is the action taken by the Studebaker Corporation, South Bend, Ind., which is reported to have postponed buying about 90 tools for which it recently inquired in the belief that lower prices will be quoted later on. Despite the present situation machine-tool builders believe there is a large amount of business in prospect which appears to await only a less unsettled feeling. Export prospects have been improved by the cable advices that Great Britain has lifted the embargo against importation of machine tools.

Industrial expansion continues in the automotive field, particularly in the Detroit district. It is estimated that $12,000,000 will be spent at Windsor, Ont., and vicinity by Detroit automobile manufacturers. As previously announced, the General Motors Corporation is preparing to invest $6,000,000 in a plant at Walkerville, Ont. The Maxwell Motor Co., now merged with the Chalmers Motor Co., has appropriated $1,000,000 for additions to its Canadian plant. The Champion Spark Plug Co., Toledo, Ohio, proposes to build a $300,000 factory at Windsor and the Auto Specialty Co., St. Joseph, Mich., plans a $250,000 investment. The Kelsey Wheel Co., Detroit, is building additions which will nearly double its Canadian production and the Motor Products Corporation, Detroit, will soon start work on a big plant to care for Canadian trade. The Republic Motor Truck Co., Alma, Mich., has decided to locate its Canadian plant at London, Ont. Work will be started immediately. Further automotive development in Canada is expected under the 6½ per cent preferential tariff which Great Britain recently put into effect to assist Canada in developing her export trade. The Hudson Motor Car Co., Dodge Brothers and the Columbia Motors Co., all of Detroit, are negotiating for Canadian branch factories.

The General Motors Corporation has acquired the plants of the Michigan Crankshaft Co., Lansing, Mich., and National Engineering Co., Saginaw, Mich., and will spend about $80,000 for new equipment. The Monarch Tractor Co., Watertown, Wis., has purchased a plant at Paulsboro, N. J., and will build tractors there for Eastern and export trade. New equipment will probably be required. The Militors Motor Co., Springfield, Mass., has taken over the Knox automobile factory in that city and will manufacture motor trucks and light passenger cars. Much of the present equipment will be serviceable. The Standard Parts Co. is building a new spring plant at Flint, Mich., which will quadruple its capacity. The Sharples Separator Co. will build a new manufacturing plant for cream separators at Chester, Pa.

Another conference between machine-tool dealers and the director of sales, War Department, will be arranged soon, at which time the dealers' proposal for the sale of Government tools will be presented, this calling for a 15 per cent commission instead of 7½ per cent offered by the Government.

New York

NEW YORK, April 29.

Conditions in the New York machine-tool market are practically unchanged. Business is in smaller volume than 30 days ago, both inquiries and sales showing somewhat of a decline. Tool distributers still have before them a large number of inquiries which they expect will be closed some time, but prospective buyers seem to be in no hurry.

The Dubied Machinery Co., 350 Broadway, New York, which inquired some weeks ago for about 100 tools, is expected to place orders next week. It was at first reported that the tools would be used for a new plant in this country, but it is now stated that all will be shipped to Switzerland and England, where the company has plants. The requirements include lathes, milling machines, shapers, grinders and drilling machines.

The Standard Oil Co. is expected to place orders this week or next for about 50 or more tools wanted for a new ship repair plant at Bayway, N. J. Action on a list of tools for shipment to Rumania has been deferred indefinitely, though purchases will probably be made when European affairs have become more tranquil.

The American Die & Tool Co., East Reading, Pa., contemplates the construction of an addition to its plant, which if built, will necessitate purchases of machine-tool equipment.

The machine-tool trade notes with interest the cable advices from England stating that the British embargo on importation of machine tools has been lifted.

Crane business is at low ebb and for every inquiry there are many seeking the order. The Worthington Pump & Machinery Corporation, New York, purchased a 10-ton crane last week and practically every crane builder in the country is said to have submitted a bid. In some cases the prices at which cranes have been sold are said to be below cost. Should business conditions improve prices for standard cranes are more likely to show advances than further de-

cranes. The city of Providence, R. I., has closed bids for six or eight cargo-handling cranes for a new municipal pier at that port.

The Hodgman Rubber Co., 8 West Fortieth Street, New York, manufacturer of rubber products, has awarded contract to Kelly & Kelly, Fourteenth Street, Long Island City, for a one-story and basement addition to its works at Tuckahoe, N. Y., 70 x 134 ft. G. B. Hodgman is president.

The Marvel Motor Truck Corporation, Brooklyn, has been incorporated with a capital of $100,000 by A. W. Beal, A. S. and P. Rampell, 103 Hart Street, to manufacture motor trucks.

The Arthur Boudreau Co., New York, has been incorporated with a capital of $50,000 by Arthur Boudreau, H. C. Beaver and F. Shultis, Jr., 16 West Sixty-first Street, to manufacture electric motors, etc.

The North American Copper Co., 52 Vanderbilt Avenue, New York, has increased its capital from $500,000 to $1,000,000.

The Lansing Co. of Delaware, 288 West Street, New York, manufacturer of wheelbarrows, etc., is taking bids for a new assembling works at 28-30 Vandam Street. Earl Cord is local manager.

The Lundie Engineering Corporation, New York, has been incorporated with a capital of $500,000 by E. L. Beatty, R. W. Crawford and J. F. Brown, 52 Broadway, to manufacture iron and steel products.

The Overman Cushion Tire Co., 250 West Fifty-fourth Street, New York, manufacturer of automobile tires, has increased its capital from $150,000 to $250,000.

A new boiler plant, 45 x 95 ft., will be erected by the Bristol-Myers Co., 277 Greene Avenue, Brooklyn, in connection with the addition to its chemical works at Hillside Township, N. J. The main works will consist of a five-story and basement structure, 80 x 300 ft., with one-story extension, 75 x 95 ft. William M. Bristol is president and treasurer.

The Plunkett Energizing Spark Plug Corporation, Brooklyn, has been incorporated with a capital of $10,000 by F. W. Lang, B. V. Plunkett and C. A. Ogren, 149 Broadway, to manufacture spark plugs.

The Manhattan Rim & Tire Corporation, New York, has been incorporated with a capital of $100,000 by F. P. Randolph, E. B. Haymond and S. Vinton, 220 Broadway, to manufacture automobile rims and tires.

The P. H. Gill Co., Lorraine and Ostego streets, Brooklyn, operating a machine works, has resumed operations on a pre-war basis for the manufacture of machined specialties for automobile concerns, etc. The company has orders on hand to insure operations at maximum capacity for some time to come, using a working force still larger than when producing for the Government. P. G. Gill is vice-president and secretary.

The George Haiss Mfg. Co., 144th Street and Canal Place, New York, manufacturer of loading machinery, wagon loaders, etc., has taken out permits for a two-story addition, 50 x 225 ft., to cost $20,000.

The Multiplex Garages, Inc., New York, has been incorporated with a capital of $100,000 by J. R. and J. B. Ashley, 345 Edgecomb Avenue, and H. S. Mansfield, 302 Central Park West, to manufacture metal garages.

The Hudson Valley Foundry Co., Kingston, N. Y., has been incorporated with a capital of $5,000 by D. J. and J. J. Murphy, and W. A. Roedell, to manufacture iron castings, etc.

C. M. English, Brooklyn, operating a shipbuilding works at 243 Greenpoint Avenue, has recently completed a shop for machine and woodworking service, to provide for increased operations. It has acquired waterfront property on Newtown Creek to form a basin for large vessels for repair and reconstruction work, in which it will specialize.

The Automatic Featuring Machinery Co., New York, has been incorporated with a capital of $400,000 by G. W. Brown, O. P. Carpenter and G. A. Williams, 154 Nassau Street, to manufacture automatic machinery.

A. J. Walcott & Co., New York, have been incorporated with a capital of $10,000 by L. R. Swift, J. Groenewald and A. J. Walcott, 439 Eightieth Street, Brooklyn, to engage in marine repair and reconstruction work.

The Brucker & Boss Machine Mfg. Co., 154 Nassau Street, New York, with plant at 209 Adams Street, Brooklyn, has been dissolved.

The Aborn Steel Co., 22 Clark Street, New York, has filed plans for extensions and improvements in its two-story warehouse, to cost about $16,000.

The Derrick & Hoist Construction Co., Brooklyn, has been incorporated with a capital of $5,000 by W. L. Berk, J. Obstler and M. M. Harding, 165 Broadway, New York, to manufacture hoisting equipment, etc.

S. W. Farber, Brooklyn, operating a brass and metal manufacturing plant at 141 South Fifth Street, is working on a five-day week schedule, continuing a plan adopted some time ago in accordance with production demands. The plant has reverted to regular peace-time manufacturing.

The Standard Pneumatic Action Co., Eleventh Avenue and Fiftieth Street, New York, manufacturer of player-piano actions, will make improvements and extensions in its works at 643-45 West Fifty-first Street, occupied under lease, to cost about $40,000.

The Cities Service Co., 60 Wall Street, New York, operating electric power plants in different sections, has increased its capital from $150,000,000 to $200,000,000.

The Pennsylvania Rivet Corporation, 187 Lafayette Street, New York, has leased property at 163 Greene Street for extensions in its local establishments.

Plans have been filed for an extension to the three-story mechanical shop of the Knickerbocker Ice Co., 331 Park Avenue, Brooklyn, at Fourth Street, corner of Bond Street, to cost about $6,000.

The Newton Balance Corporation, New Rochelle, N. Y., has been incorporated with a capital of $5,000 by G. J. Glatz, J. Spiegler and N. Muller, New Rochelle, to manufacture precision equipment.

The Doehler Die Casting Co., Ninth and Huntington streets, Brooklyn, is considering the erection of an extension to its works on adjoining property recently acquired. It is now engaging on a pre-war basis and is giving employment to over 100 persons.

The Rotary Vending Machine Corporation, 560 Broadway, New York, manufacturer of vending machines, has been dissolved.

The Butterfly Phonograph Motor Corporation, New York, recently incorporated with a capital of $75,000 to manufacture small motors, etc., has leased a floor in the building at 243-7 West Seventeenth Street, for its local establishment. M. Samuels, W. and M. Kossman are the incorporators.

W. H. Stetson, 43 Cedar Street, New York, has become local representative for the Consolidated American Industries, Inc., of Delaware, capitalized at $500,000, to manufacture automobile parts.

The Kimble-Durand Glass Co., Vineland, N. J., manufacturer of scientific glass specialties, is considering plans for the rebuilding of its mechanical building recently destroyed by fire with loss of $15,000, including the special equipment.

The Canister Co. of New Jersey, North Broad Street, Phillipsburg, N. J., manufacturer of fiber cans and containers, will build a two-story addition to its plant, 40 x 130 ft., to cost $50,000. Alterations and improvements will also be made in the works. Frank C. Rex is vice-president and general manager.

Operations for shell loading have been discontinued at the plant of the Bethlehem Loading Co., Mays Landing, N. J., and the plant and grounds are now being occupied by the Ordnance Department as a depot. The disposition of the works has not as yet been decided.

The Perth Amboy Dry Dock Co., Perth Amboy, N. J., is rebuilding one of its large drydocks, which will be provided with additional shop facilities.

The Riverside Garage & Machine Shop, Inc., Edgewater, N. J., has been incorporated with a capital of $10,000 by William E. and Albert A. Allwood, and Joseph C. Woodcock.

William T. Wilkinson & Son, Inc., Kearny, N. J., has been incorporated with a capital of $25,000 by William R. Wilkinson, 170 Windsor Street, William T. and E. Wilkinson, to manufacture iron and steel.

The Viehweger Burglar Alarm Lock Co., 175 Lembeck Avenue, Jersey City, N. J., has filed notice of organization to manufacture special locking devices. August V. W. Viehweger heads the company.

The Cox Automobile Pipe Bending Co., Newark, N. J., has leased a one-story plant at 125-29 Gotthardt Street, with adjoining property totaling 100 x 200 ft., for a new plant.

The Splitdorf Electrical Co., 98 Warren Street, Newark, N. J., manufacturer of motor ignition systems, etc., has closed its plant for two weeks, following the completion of Government contracts, for the purpose of taking an inventory. Up to now about 1800 persons have been employed, and upon the resumption of operations on a pre-war basis it is planned to reduce this working force materially.

The Yankee Snap Fastener Co., Newark, N. J., has been incorporated with a capital of $125,000, by Arthur T. Vanderbilt, Irving Eisenberg and E. P. Adam.

A one-story brick machine shop, to cost about $25,000, will be erected by the E. V. Connett Co., 79 Richmond Street, Newark, N. J., in connection with the construction of a three-story addition to its hat manufacturing plant.

Buffalo

BUFFALO, April 28.

The American Radiator Co., Elmwood Avenue, Buffalo, has completed plans for a one-story addition, 40 x 44 ft., for a boiler assembly works, to cost $20,000.

The Eberhart Steel Products Co., Buffalo, has been incorporated with a capital of $25,000 by F. G. Mitchell, C. Eberhart, Jr., and C. J. Staples, to manufacture airplanes, parts, etc.

The Ordnance Department, United States Government, has arranged to occupy the North Elmwood Street plant of the Curtiss Aeroplane & Motors Corporation, Buffalo, as a concentration point for motor trucks, machinery and other war supplies purchased, and which have not been placed in service. It is planned to arrange the structures to provide facilities for the storage of over 5000 trucks and considerable quantities of machinery, so as to thoroughly safeguard and expedite the handling of the property.

Jacob House & Sons, Inc., 52 St. Paul Street, Buffalo, manufacturer of bottlers' equipment and supplies, has increased its capital from $20,000 to $50,000.

The Giant Truck Corporation, Buffalo, has been incorporated in Delaware with a capital of $1,200,000 by Robert S. Beveridge, Frank H. Brown and Charles J. Hines, to manufacture motor trucks.

The Safety Vapor Heating Corporation, Buffalo, has been incorporated with a capital of $10,000 by H. J. Turner, L. A. Cherry, and W. B. Powell, to manufacture heating devices.

The Massey-Harris Harvester Co., Batavia, N. Y., is considering plans for a new one-story reinforced-concrete addition 60 x 170 ft., on Harvester Avenue.

The Automatic Photo Devices Corporation, Buffalo, has been incorporated with a capital of $5,000 by H. E. Woolever, J. J. and E. K. Engle.

The Philo Burt Mfg. Co., 5 West Fourth Street, Jamestown, N. Y., manufacturer of braces and surgical appliances, has increased its capital from $10,000 to $75,000. William M. Bemus is president.

The Haskell Brothers Corporation, Youngstown, N. Y., has been incorporated with a capital of $20,000 by N. D., B. D., and C. H. Haskell, to manufacture tractors and agricultural machinery.

The proposed aeroplane manufacturing plant at Binghamton, N. Y., to be constructed by the Lewis & Vought Corporation, Webster and Sixth avenues, Long Island City, will be located on about 15 acres here, recently secured by the company.

The Brewer-Tichener Corporation, Cortland, N. Y., manufacturer of carriage and automobile accessories, will install new equipment in the enamelling department at its Binghamton plant, including a new electrically-operated oven and auxiliary apparatus.

The Rovertaft Electric Appliance Co., Binghamton, N. Y., has been incorporated with a capital of $25,000 by A. B. Rover, J. O. Taft and L. C. Rhodes.

In connection with the increase of capacity at the plant of the Nineteen Hundred Washer Co., Binghamton, N. Y., manufacturer of washing machinery, it is planned to operate considerable equipment with individual motor drive. The output will be increased from about 100 to 200 machines per day. Branch plants are operated at Scranton, Pa., Omaha, Neb., and Indianapolis, Ind. W. G. Trowbridge is secretary and treasurer.

The Cannon-Stein Steel Corporation, Syracuse, N. Y., has been incorporated with a capital of $25,000 by W. F. Stein, E. P. Cannon and C. S. Estabrook, 727 Comstock Avenue, to manufacture iron and steel.

A new boiler house, pumping plant, tanks, etc., will be erected by the Sun Co., Syracuse, N. Y., in connection with its new oil station at Sunset and Turtle avenues.

Fire, April 18, destroyed the plant of the Iroquois Pulp & Paper Co., McKeever, N. Y., with loss of about $25,000.

The Reliable Stamping Co., Buffalo, James H. McCaffrey, president, 1392 Niagara Street, is having plans prepared for a factory, 36 x 90 ft., brick and steel, to be erected at Lafayette Avenue and Niagara Street; estimated cost $20,000.

The U. S. Rubber Reclaiming Co., Buffalo, will build a one-story top addition to building No. 3, 85 x 100 ft., at its plant at Babcock Street and the Erie Railroad.

New England

BOSTON, April 28.

The textile machinery people report a slight improvement in the outlook as it affects their business. Central Massachusetts contains the lion's share of the textile machinery works of the country, the plants including those of the Draper Co., Hopedale, the largest manufacturer of cotton weaving machinery in the world; the Crompton & Knowles Loom Works, which boasts the same distinction as builder of woolen looms, the great Whitin Machine Works of Whitinsville, and other smaller though important plants. This branch of the machinery business has not been wholly dull since the armistice, but neither has it been prosperous as measured by the standard set by the war, and it has been exceedingly uneven. In the staple lines, including both cotton and woolen looms, little business has been done. The Crompton & Knowles Loom Works is clearing up odds and ends of special looms for customers, whose needs could not be attended to while the war was on, because production was concentrated on looms to produce war materials, in fabric and in wire. On the other hand, certain types of textile machinery other than looms have been in quite active demand. Manufacturers report a better feeling as indicated by inquiries, and believe that the low point of business has passed.

The Worcester district of the American Steel & Wire Co. reports little business for such wire as enters into what may be termed utilitarian products, but there is some demand for wire used in articles of luxury.

The Militors Motor Co., Springfield, Mass., plans to manufacture at the Knox plant, following the recent merger, a new motorcycle, a heavy motor truck having a 4-wheel drive, and the line of light cars for passenger service. An experimental department has been reorganized and the work of standardizing the factory operations for the new output is in progress. It is expected that about 800 to 1000 skilled mechanics will be required when work is fully under way. N. R. Sinclair, formerly president of the Militor corporation, is president of the new company. Associated with him are George W. Dunham, vice-president, who was also vice-president of the Militor corporation; second vice-president, R. L. Notman, formerly secretary of the Militor corporation and formerly vice-president of the McKinnon Dash Co.; treasurer, E. O. Sutton, who was also treasurer of the Knox Motors Co. The general executive and sales offices are at 111 Broadway, New York.

The Hill Shops of the United States Arsenal, Springfield, Mass., will have some additions and alterations to the engine room and a $25,000 building contract has just been awarded. Changes involve two stories and a basement, of brick construction.

The Wallace Barnes Co., Bristol, Conn., will erect a new factory building and make some additions to the present main structure, the whole involving about $55,000.

The Sherman Automatic Oil Burner Co., contemplates the building of a plant in Worcester, Mass. John A. Sherman, president, Sherman Envelope Co., is the inventor of the device.

Erection has begun on the addition, one story, 60 x 72 ft., frame and stucco, for the New London Ship & Engine Co., Groton, Conn.

Contractors are now figuring on the erection of the new blacksmith shop, one story, 20 x 78 ft., brick, with frame roof, for the J. R. Torrey Razor Co., Worcester, Mass.

The Public Electric Light & Power Co., St. Albans, Vt., is preparing plans for an addition to the power station and transmission line equipment at Fairfax, Vt.

Some contracts are already let and work will begin at once on the erection of the machine shop addition, two stories, 40 ft. x 177 ft., $35,000, for the Donnelly Machine Co., Brockton, Mass.

Plans covering the building with the necessary manufacturing machinery and other equipment for the Northway Motors Corporation, West Natick, Mass., will be ready early in May. The building will be one story, 200 x 260 ft.

An $8,000 addition, two stories, 47 x 88 ft., concrete construction, has been started at the machine shop of Idela L. Norton, Lowell, Mass.

The George E. Keith Co., Brockton, Mass., has received bids on the erection of a power house, one story, 60 x 70 ft.

The Peck, Stow & Wilcox Co., Southington, Conn., manufacturer of hardware, tools, etc., has let a contract to the Torrington Building Co., Torrington, for the construction of a six-story addition, 55 x 110 ft.

The Bridgeport Rolling Mills, Inc., Stratford, Conn., has been incorporated with a capital of $150,000 by Carl Foster, Bridgeport; Oliver V. Mahan, Milford, and James G. Mackay,

Stamford, to manufacture fabricated materials, metal sheets, etc.

The Stanley Rule & Level Co., New Britain, Conn., has filed plans for the construction of a one-story addition to its plant, about 17 x 100 ft., on Elm Street.

The Liberty Carburetor Co., Providence, R. I., has been incorporated in Delaware with a capital of $25,000 by Rey M. Upton and Arsene B. Desbreches to manufacture carburetors, etc.

The Textile Ball Bearing Co., 112 East Avenue, Pawtucket, R. I., has filed notice of organization to manufacture ball bearings. Joseph F. McGowan heads the company.

The New Haven Sherardizing Co., New Haven, Conn., has increased its capital from $30,000 to $50,000.

The United Mfg. Co., 57 Willow Street, Springfield, Mass., manufacturer of celluloid products, has had plans prepared for the construction of a new one-story plant at 168 Birnie Avenue.

New electric-operated pumping machinery will be installed by the Equinox Spring Co., Manchester, Vt.

The Commercial Products Co., Inc., New Britain, Conn., has been incorporated with a capital of $50,000 by Harold E. Shepard, E. M. Beecher and F. W. Macomber to manufacture wrenches, mechanics' tools, etc.

The Carlisle Cord Tire Co., Andover, Mass., manufacturer of automobile tires, has acquired property, 400 x 1000 ft., on Fairfield Avenue, Stratford, Conn., and plans for the construction of a new one-story plant, 150 x 250 ft.

The Springfield Brass Co., Springfield, Vt., is reported to be planning for the installation of a new electric furnace with auxiliary apparatus at its works. The company specializes in the production of high-grade brass castings.

The Caloric Furnace Co., New Haven, Conn., has filed notice of organization to manufacture furnaces, etc. W. C. Bettelou, 113 College Street, heads the company.

Pittsburgh

PITTSBURGH, April 28.

Williams & Co., 220 Penn Avenue, Pittsburgh, manufacturer of monel metal, have acquired a plant site on Pennsylvania Avenue, Northside section, about 100 x 380 ft., with a two-story and one-story building, which will be used by the new owner for general production. About $45,000 was paid for the property.

Fire, April 20, destroyed the plant of I. Richman & Co., Washington, Pa., metal and junk dealers, with loss estimated at $25,000. The main building was 40 x 200 ft.

The Wolverine Supply & Mfg. Co., Page and Fontella streets, Pittsburgh, manufacturer of hardware specialties, etc., is having preliminary plans prepared for an addition to its five-story plant, 70 x 100 ft. B. F. Bain is president and general manager.

The Pittsburgh Model Engine Co., Pittsburgh, has filed plans for a one-story, brick and steel addition to its plant on Lexington Avenue, to cost about $10,000. The company has awarded a contract to the Austin Co., Pittsburgh, for the erection of its proposed plant to cost close to $200,000.

The Casparis Stone Co., Casparis, vicinity of Connellsville, Pa., will rebuild its three crusher buildings recently destroyed by fire.

The Chittum Patent Tool Co., Charleston, W. Va., has been incorporated with a capital of $10,000 by W. L. Chittum, Spring Hill, W. Va., and associates, to manufacture special tools.

The Pemberton Coal Co., Affinity, W. Va., has commenced the erection of a one-story machine shop and power plant at its local properties.

The American Valve & Tank Co., Fairmont, W. Va., has been incorporated with a capital of $350,000 by W. K. Barnes, E. C. Frame and H. H. Rose, to manufacture valves and brass goods.

The Kanawha Colleries Co, Charleston, W. Va., is considering the erection of an electric power plant 32 x 50 ft.

The Welch Armature Co., Welch, W. Va., is planning the erection of a three-story plant for increased output. It recently increased its capital to $25,000.

The Allison Mine Car Sprag Co., Bluefield, W. Va., has been incorporated with a capital of $25,000 by W. E. Ross, C. B. Lambert and Samuel M. Lambert to manufacture braking devices for mine-car service, etc.

Tinder & Hamilton, Charleston, W. Va., are considering the establishment of a works for the manufacture of talking-machine cabinets and are asking prices on machinery for this purpose.

The Ohio Valley Mine Car Mfg. Co., Huntington, W. Va., has been incorporated with a capital of $400,000 by M. J. Ferguson, J. W. Heron and M. E. Brown to manufacture mine cars and other mine equipment.

The plant of the Briggs Electrical Co., Charlottesville, Va., was recently destroyed by fire with loss estimated at $12,000.

The Colonial Concrete Products Co., having purchased six acres along the Baltimore & Ohio Railroad at Glenshaw, Pa., has started excavating and will erect several buildings, in addition to reconstructing the buildings already on the site. The contract for the purchase of the machinery has been let to the Riflaw Metal Sales Corporation, Pittsburgh Life Building, Pittsburgh, Pa.

The Sanitary Co. of America, Linfield, Pa., has just operated the first heat in its branch plant at East Greenville, Pa. Since acquiring this plant it has made extensive alterations and will devote the entire works to manufacturing plumbers' cast-iron specialties. If labor conditions at that point will warrant it, they expect to build an addition, 75 ft. x 135 ft., during the present year. The plant it occupies was purchased from the Keystone Motor Mfg. Co. early this year. It is also planning to expand its specialty line, adding a complete line of sand traps, anti-syphon traps, drum traps, special drains, etc. The officers of the company are: E. M. Rhoads, president and treasurer; Grant P. Bechtel, assistant treasurer; B. W. Frederick, secretary; L. A. Shiffert, assistant secretary."

Philadelphia

PHILADELPHIA, April 28.

The Scranton Iron & Steel Co., Scranton, Pa., has just received a contract to install 52 flights of steel stairway in a new colliery under construction for the Hudson Coal Co. to replace colliery No. 5 at Plymouth, Pa., recently destroyed by fire. The Scranton company has not been affected by the slump in iron and steel business and has a number of other contracts which will keep it busy for some months. No men have been laid off and no shorter hours adopted since the cessation of hostilities. Edgar L. Keuling is president.

The Silvex Co., Bethlehem, Pa., manufacturer of spark plugs, has received a contract from the International Harvester Co., Chicago, for plugs to be used as part of the equipment of all the farm tractors made by the Chicago concern. An additional force of workmen will be taken on by the Silvex Co. to complete this contract.

The Keystone Screw Co., Philadelphia, has filed notice of an increase in capital stock of from $100,000 to $250,000. E. J. Lavina is the principal stockholder.

The Service & Parking Garage Co., Lancaster, Pa., has been incorporated with a capital stock of $50,000 by Andrew G. Landis, John G. Hess and S. K. Landis.

The Snyder Mfg. Co., Altoona, Pa., has been chartered with a capital stock of $10,000 to manufacture castings, by C. W. and G. S. Snyder, A. L. and F. H. Feltwell.

The American Dispensing Machine Co., Pittsburgh, recently organized, has been chartered with a capital of $50,000 to manufacture food-dispensing machinery. The stockholders are John G. Peters, Arthur Johnson, H. W. Hodgson, J. F. Wineland and Robert H. Baum.

The Keystone Supply & Mfg. Co., 927 North Ninth Street, Philadelphia, manufacturer of plumbers' supplies, brass goods, etc., will build a one-story brass shop to cost $5,000.

The Standard Dental Mfg. Co., Twenty-fifth and Diamond streets, Philadelphia, has filed plans for extensions in its plant at 2411 West Norris Street, to cost $8,000.

A two-story boiler plant addition, 35 x 35 ft., to cost $10,000, is being erected by Blumenthal Brothers at their works at Margaret and Tacony streets.

The Atlas Welding & Machine Co., Philadelphia, has been incorporated in Delaware with a capital of $20,000 by F. R. Hansell, Land Title Building, and E. M. McFarland, to manufacture welding specialties, etc.

The New York Shipbuilding Corporation, Camden, N. J., is now giving employment to about 12,000 men at its yard, and is planning to increase this number by at least 4000 employees with the inauguration of operations at its new south yard, now nearing completion. The company is now engaged in building three steamships, the largest vessels of their type under construction at any plant in the country. The ships will be 535 ft. long, to be equipped with Babcock & Wilcox water-tube boilers and Westinghouse turbines; each vessel will have a displacement of about 21,000 tons.

The company will also commence the construction of two battleships for the Government. M. A. Neeland is president; H. C. Towle is works manager.

The Pennsylvania Iron & Steel Products Co., New Castle, Pa., a Delaware corporation, has increased its capital from $100,000 to $300,000.

The Citizens Electric Co., Williamsport, Pa., has had plans prepared for a one-story electric power plant, 60 x 120 ft., to be used for increased capacity. It is estimated to cost about $200,000 with equipment.

The P. M. Sharples Co., manufacturer of cream separators, etc., West Chester, Pa., has formally announced, through its president, P. M. Sharples, its intention to remove its works to another city, as recently reported. The new plant is to be located at Chester, the company having acquired a large site there recently. The present plant is giving employment to about 400 persons and an equal, if not greater number will be used at the proposed works.

The Public Service Commission, Harrisburg, Pa., has granted permission to the following electric companies to issue securities in the amounts noted for proposed extensions, betterments, etc.: Bradford Electric Co., Bradford, $400,000 in bonds; Citizens Electric Co., Williamsport, $250,000, bonds; Penn Central Power & Transmission Co., Altoona, $19,000, bonds; Buffalo, Rochester & Pittsburgh Railways Co., Pittsburgh, $4,587,000, and $40,000 bonds; Erie Lighting Co., Erie, $1,850,000; Beaver Valley Traction Co., New Brighton, $100,000; Penn Central Light & Power Co., Altoona, $119,990, bonds; and the Fairmont, Morgantown & Pittsburgh Railroad, $209,000, bonds.

The Liberty Can & Sign Co., Philadelphia, will make extensive improvements in the factory at North Water and North Marison streets, Lancaster, Pa., for a new works. The plant will be arranged as a one-story and four-story works, 25 x 125 ft. and 46 x 100 ft., respectively, and is estimated to cost about $40,000. J. C. Gibbs, 1710 Market Street, Philadelphia, is one of the stockholders.

A machine repair works will be installed in the new service station to be established at Sixteenth and Walnut streets, Harrisburg, Pa., by the Harrisburg Auto Tire Repair Co.

Hersh & Bro., Allentown, Pa., operating a plant on Mill Street, for the manufacture of sheet-metal products, etc., have acquired the Bicalky Fan Co., Buffalo, N. Y., and will manufacture fans of this type, air washers, revolving ventilators, etc. G. Willis Hersh is one of the heads of the company.

Detroit

DETROIT, April 28.

Industrial expansion continues. The Hudson Motor Car Co. and Dodge Brothers, Detroit, are negotiating with officials in Windsor, Ont., for the establishment of branch factories. The Columbia Motors Co., Detroit, is also planning the erection of a new factory on property purchased along the river front. Without exception local automobile concerns are running to capacity and are behind in their orders, and similar reports come from practically all automobile plants in the State.

The Saginaw Malleable Co., Saginaw, Mich., has increased its capital stock $500,000 and will double the capacity of its present plant. One addition is being completed and two more units will be constructed at a cost of $275,000. The concern is a subsidiary of the General Motors Corporation. C. F. Drozeski is president and J. B. Kirby secretary.

The General Motors Corporation has acquired the properties of the Michigan Crankshaft Co., Lansing, Mich., and the National Engineering Co., Saginaw, Mich., and will spend $100,000 at once on these works, of which $80,000 will be for new equipment. J. W. Wilford, Lansing, will have supervision of the Lansing and Saginaw plants.

The United Brass & Aluminum Mfg. Co., Pt. Huron, Mich., has enlarged its plant and is erecting a gray iron foundry.

The Advance Pump & Compressor Co., Battle Creek, Mich., has appropriated $75,000 for an addition to its plant.

The Maxwell Motor Co., Inc., Detroit, has appropriated $1,000,000 to construct a plant in Walkerville, Ont. The Champion Spark Plug Co., Flint, Mich., will also erect a plant in that city.

The Chalmers Motor Car Co., Detroit, has been definitely merged with the Maxwell Motor Co. The Chalmers plant has a capacity of about 25,000 cars a year and the Maxwell about 60,000. The two companies have been operating virtually as a merger through a five-year lease of the Chalmers plant since Sept. 1, 1917.

Baltimore

BALTIMORE, April 28.

The Baltimore Commutator Co., 55 Gunther Building, Baltimore, has been incorporated with $155,000 capital stock to manufacture commutators or timers for internal combustion engines, etc. The incorporators are David M. Fulton, J. Harry Philbin, Alexander Hamill, Benjamin F. Bond and Harry E. Parkhurst.

Swift & Co., Eutaw and Camden streets, Baltimore, will build a one-story engine room, 14 x 18 ft., at 412 Perry Street, to cost $3,000.

The plant of the Eastern Shore Shipbuilding Corporation, Sharptown, Md., located on the Naticoke River, will be sold at auction by the receivers on the premises on May 15. The receivers are Roger B. Wood and Calvin P. Moon, Sharptown. The plant is now being operated by the receivers and seven vessels are under construction. During the last year and a half the plant has been remodeled and new equipment installed. There are six ways.

The general machine work and automobile repair plant of the Rogers & Abels Co., Baltimore, has been removed from 815 Hillen Street to 1311-1321 Harford Avenue and greatly enlarged.

Shaffer & Locke, Hagerstown, Md., plan to install an acetylene welding plant.

R. E. Sparks, St. George Hotel, Norfolk, Va., will install electric welding equipment.

The Gulf Refining Co., Pittsburgh, is said to be planning the construction of a refinery at Norfolk, Va., to cost several hundred thousand dollars.

The American Truck Body Co., Martinsville, Va., plans to establish a plant with an output of about 35 bodies a day.

The plant of the Briggs Electrical Co., Charlottesville, Va., was recently damaged about $12,000 by fire.

Hackley Morrison, Richmond, Va., wants prices on 4-ft. ball mills, steam-driven air compressors, 75-hp. double-cylinder mine hoists and boiler tubes.

John Miner, Ronda, N. C., is seeking prices on 20-hp. kerosene engines.

John Rourke & Sons, Savannah, Ga., have been incorporated with $300,000 capital stock and are said to be planning to increase their marine repair facilities.

Bruce Brothers, Brunswick, Ga., want prices on machinery for the manufacture of barrels.

The Interstate Foundry Co., Anniston, Ala., wants prices on new or second-hand lathes.

The Weldon Machinery & Foundry Co., Weldon, N. C., has been incorporated with $25,000 capital stock.

R. F. and Frederick Hamme, Wilmington, N. C., are said to be planning to build a marine railway for the construction of wooden vessels on Cape Fear River.

The North Carolina Granite Corporation, Mt. Airy, N. C., wants prices on 200-hp. water-tube boilers, air compressors and hoisting engines.

The Hess Steel Corporation, Biddle Street and Loney Lane, Baltimore, has awarded contract to Dietrick Brothers, Pleasant Street, for a one-story addition, 60 x 200 ft. and 60 x 160 ft., to be equipped as an annealing works and for other service.

C. F. Thomas & Son, Main Street, Buckeystown, Md., are planning the erection of a one-story plant, 50 x 150 ft., to be equipped for the manufacture of brick, including mixing works, mechanical conveyor system, etc. The plant is estimated to cost about $25,000. J. F. Baker is in charge.

Shaffer & Locke, 684 Pennsylvania Avenue, Baltimore, are planning for the establishment of an extension to their plant for welding operations for aluminum, copper, brass, etc.

The plants of the Rupp Mfg. Co., manufacturer of machine parts, baskets, etc., and the Hagerstown Cap Co., manufacturer of bottle caps, etc., located in the P. L. Rickard Building, Hagerstown, Md., were destroyed by fire recently with loss estimated at about $100,000.

The Hill-Field Body Co., Salem, Va., has been organized by H. B. Rockhill and associates with capital of $50,000 to manufacture automobile bodies.

The Norfolk Power Appliance Corporation, Norfolk, Va., has been incorporated with a capital of $25,000 by Paul F. Mueller and associates to manufacture electric and other power equipment.

The Weldon Machinery & Foundry Co., Weldon, N. C., has been incorporated with a capital of $25,000 by R. A. Harris and associates.

The McCullough Iron Co., Wilmington, Del., is planning the rebuilding of the section of its local plant, recently destroyed by fire with loss reported at $50,000.

The Universal Splicing & Seizing Clamp Co., Alexandria, Va., has been incorporated with a capital of $35,000 by Frank D. Holt, E. J. Anderson and A. J. T. Wendt-Weidt.

Cleveland

CLEVELAND, April 28.

Some further price reductions on machine tools have been announced and a tendency is noted among manufacturers to make such reductions as will stabilize prices. Some machine-tool builders marked up prices much more than others during the war, and these, in many cases, are the ones who are making the sharpest cuts. Some builders who followed a conservative policy have not reduced prices. The latest reductions are about 15 per cent on radial drills, 10 per cent on single pulley drive milling machines, and 20 per cent on code type milling machines. These cuts have not been made by all manufacturers.

There is a good volume of inquiry for lots of two and three machines, but no large lists came out the past week. Buyers are apparently slow in placing orders after submitting inquiries. Reports among local machinery houses indicate that the Studebaker Corporation has not yet purchased any of the tools in its list of about 90 machines issued recently, and is holding off in the hope of getting lower prices. New inquiry is coming almost entirely from automobile and automobile parts manufacturers. The Wehrle Co., Newark, Ohio, stove manufacturer, expects to close shortly for 7 machines for which it recently sent out an inquiry. An inquiry from the Central Steel Co., Massillon, for about 10 large machines is still pending. The Drillers' Machine Shop Co., Lawtona, Okla., has placed an order with a local machinery house for 9 used machines. The recent reduction in lathe prices amounting to about 20 per cent for several makes has stimulated the demand for heavy lathes.

The Standard Parts Co., Cleveland, has commenced the erection of a new spring plant at Flint, Mich., which will provide four times as much capacity as its old works. It will consist of three complete building units arranged for progressive operations. The Hunkin-Conkey Construction Co., Cleveland, is the contractor.

Local machinery houses have received an inquiry from the Finch Mfg. Co., Scranton, Pa., for a 36 in., 20 in. and 14 in. heavy duty engine lathe; vertical slotter, with a 12-in. stroke, and a 60 in. heavy duty vertical boring mill.

Cleveland engineers are figuring on a contract for a new foundry extension for the Goodale Co., Kalamazoo, Mich. Plans call for a building 110 x 280 ft.

The Cleveland Rubber Mold & Machine Co., Cleveland, has been incorporated with a capital stock of $1,000,000 to manufacture rubber molds and other products. F. J. Fairfield, Engineers' Building, one of the incorporators, advises that the company will open offices at 406 Schofield Building, and contemplates erecting a plant on Warren Road.

It is announced that the Ford Motor Co., Detroit, will establish an assembling plant in Toledo, Ohio, in the building formerly occupied by the Arbucke-Ryan Co., at Monroe and Ontario streets. It is a five-story and basement brick structure with 196,000 sq. ft. of floor space. It will be remodeled and equipment added.

The Ohio Collieries Co., Toledo, is in the market for two lathes, a planer and a steam hammer.

The City Machine & Tool Co., Toledo, which recently increased its capital stock, will, in addition to its present products, make dies to be used in the manufacture of automobile stampings.

The Central Steel Co., Massillon, Ohio, is still in the market for machine shop equipment which includes a horizontal boring, drilling and milling machine, floor type with 5 in. bar; No. 5 milling machine; 36 in. x 24 ft. and 26 in. x 15 ft. engine lathes; 20 in. slotter; 6 ft. and 4 ft. plain radial drills; 66 x 16 in. spur gear cutter, and a 96 in. x 20 ft. planer.

The B. F. Goodrich Rubber Co., Akron, Ohio, will build a three-story machine shop and extensions, involving an expenditure of $93,000.

The Hoover Suction Sweeper Co., North Canton, Ohio, contemplates the erection of a new plant in Hamilton, Ont., and has voted an increase in its capital stock from $1,000,000 to $2,000,000.

The Gymon Crossing Co., Marion, Ohio, which was recently incorporated with a capital stock of $100,000 by B. E. Wilson and others, is reported to be planning the construction of a factory.

The Made-Rite Rubber & Tire Co., Newton Falls, Ohio, is preparing for the erection of a two-story and basement plant, 60 x 200 ft., boiler house, 40 x 80 ft., and an office building. Plans have been prepared by Robert J. Keich, architect, Warren, Ohio.

The Mansfield Tire & Rubber Co., Mansfield, Ohio, has had plans prepared for a four-story addition, of brick and steel.

The Supreme Motors Corporation, Warren, Ohio, will build an extension providing 30,000 sq. ft. of additional floor space. The company has been engaged in assembling automobile engines, but with the extensions to the plant, it is stated the engines will be built complete. New equipment will be required.

A new plant will be erected in Warren, Ohio, by the American Block & Mfg. Co., which has been organized recently by George Konold, N. J. Konold, E. T. Ward and others.

The Allen Motor Co., manufacturer of automobiles, with plants in Fostoria and Bucyrus, Ohio, will move its plant to Columbus, Ohio.

The Lima Sheet Metal Products Co., Lima, Ohio, which recently established a plant, has elected H. W. Falk president and general manager, A. W. Wheatley vice-president, and S. M. Churchill secretary and treasurer.

The James Ohlen & Sons Saw Mfg. Co., manufacturer of wood and metal cutting saws, Columbus, Ohio, has opened a branch warehouse at 1368 West Third Street, Cleveland. Robert H. Hunter, for the past 12 months the company's representative in northern Ohio, has been appointed manager of the new branch. During the past year the Ohlen company has increased its facilities by the addition of a machine shop and office building, and has increased the output of the wood and metal band saw, circular and hand saw departments by building three new furnaces, installing oil tempering apparatus, improved flattening equipment and a battery of eight patent milling machines. The company proposes to engage more generally in the manufacture of all hard and flexible back metal band saws than it has in the past, and is also entering the hand saw field on a much larger scale.

Milwaukee

MILWAUKEE, April 28.

Inquiries that are being received by machine-tool manufacturers and jobbers indicate that there is a vast amount of new business in prospect which appears to await only a less unsettled feeling in general industry. Some fair orders are being placed from day to day, but on the whole there is a tendency to hold off which seems more pronounced just now than during the last three or four months. Milling machine builders continue to receive a fair amount of new business, which comes principally from the automotive industries. Outside of this the demand is meager. A brisk movement in the direction of new garage and repair shop construction throughout Wisconsin is resulting in a good inquiry for the lighter types of tools and the used tool market is benefiting thereby as well.

Steel founders have been able to maintain operations at a liberal capacity, but the outlook for shops doing the heavier class of casting work is not regarded as particularly bright. Iron founders are keeping busy, but are obliged to depend upon the automotive industries for a considerable percentage of their orders.

The Gerlinger Electric Steel Foundry Co., West Allis, has purchased the plant and property of the Radcliffe Mfg. Co., a general wood-working concern, adjoining its foundries. The real estate contains 1⅝ acres and is improved with two large buildings, both two stories. One building will be converted into a machine shop, laboratory, pattern shop and flask shop, and the other will be used as a private garage and service shop. As previously noted, the Gerlinger company is building a one-story brick, concrete and steel addition, 84 x 150 ft., for the new electric steel foundry which was placed in operation late in January. This will be ready about May 15. Walter Gerlinger is secretary.

The Hamilton Mfg. Co., Two Rivers, Wis., manufacturer of steel and wooden cabinets and furniture, is contemplating the enlargement of its steel shop, erected about four years ago and now outgrown. Details are not yet available.

The Monarch Tractor Co., Watertown, Wis., has acquired a manufacturing plant at Paulsboro, N. J., and will utilize it for the production of farm tractors to supply the Eastern and export trade. The daily capacity of the New Jersey plant is 10 machines. The main works at Watertown are producing six tractors of a heavier type, and in addition the company maintains a Canadian plant at Branford, Ont., with an output of four machines a day. The Monarch company is planning to place in production a two-wheeled garden type tractor, beginning May 1 or 15.

The Appleton Engine Works, Appleton, Wis., will build a one-story brick machine shop addition, 30 x 50 ft., which will cost about $12,000 with new equipment now being purchased. Moritz Heineman and Rudolph Schwerke own and manage the plant, which produces gas engines and handles custom machine work and repairs.

Smart & Phillips, 613-617 University Avenue, Madison, Wis., have plans for a two-story brick and concrete garage, machine shop and service building, 74 x 165 ft., at University Avenue and Frances Street. The shop will be located on the main floor, occupying a space 55 x 74 ft.

Kister & Moericke, Kenosha, Wis., are building a public garage and repair shop, 50 x 160 ft., one-story and part basement, at 1005-1013 Elizabeth Street, which will cost about $17,000 complete.

The Reichert Mfg. Co., 1440 Booth Street, Milwaukee, has changed its corporate style to Metal Forms Corporation. It manufactures patented steel and iron adjustable forms and molds for reinforced concrete construction. The change in name is made to more properly designate the nature of the business.

The Sheboygan Aluminum Co., Sheboygan, Wis., organized recently with a capital stock of $50,000 to manufacture aluminum castings, stampings, etc., decided to increase the authorized capital to $100,000 at the stockholders' meeting for permanent organization. Officers were elected as follows: President, William A. Erdmann; vice-president, Noah Saemann; treasurer, Charles Voigt; secretary, William F. Toepel; director, William Markwardt. The company is installing equipment in a part of the S. W. Miller Piano Co. factory and hopes to be able to begin production by June 1.

The F. R. Dengel Mfg. Co., Milwaukee, manufacturer of material and supplies for plumbers and steamfitters, will build a one-story brick addition, 35 x 60 ft., to its plant at 342 Fourth Street. F. R. Dengel is president.

The Raab-Thieman Co., Sheboygan, Wis., Ford dealer, will expend $25,000 in the erection of a new service building, 60 x 100 ft., two stories and basement, on North Eighth Street, near St. Clair Avenue. The entire second floor will be used as a machine and repair shop and considerable new equipment will be required. The company also will enlarge its present establishment on Niagara Avenue at a cost of $10,000. Robert H. Thieman is secretary and treasurer.

The Chicago & North-Western Railroad Co., Chicago, is completing an addition to its division shops at Kaukauna, Wis., to be used exclusively for the production and compression of acetylene gas for welding and cutting tools used at its various shops in central and northern Wisconsin, heretofore supplied from Chicago. The new plant and equipment represent an investment of about $15,000.

The Board of Education, Two Rivers, Wis., expects to be ready to take bids May 20 or 25 for the erection of three units to the Two Rivers High School designed by John D. Chubb, architect, 109 North Dearborn Street, Chicago, including one 48 x 70 ft., two stories, for manual training. H. P. Hamilton is president of the board.

H. J. Dunham & Son, Wyocena, Wis., have plans for a public garage and repair shop, 30 x 120 ft., costing $12,500.

The Eagle Mfg. Co., Appleton, Wis., manufacturer of gas engines, farm tractors, etc., has increased its capital stock from $200,000 to $500,000 to finance a plant enlargement project now being carried out. The foundry and machine shops are being enlarged to provide a capacity of from 60 to 75 farm tractors per month. The major interest in the corporation changed hands several weeks ago, Frank and Oscar Saiberlich retiring. As the result of the reorganization new officers have been elected as follows: President, A. W. Priest; vice-president, August H. Meyer; second vice-president and general manager, Charles Hagen; secretary and treasurer, Edward W. Saiberlich. H. W. Williams is sales manager and R. A. Raschig purchasing agent.

C. F. Dallman and Frank Schoepke, Antigo, Wis., inventors and patentees of a new type of all-metal unloading skid for barrels, boxes, etc., are making preparations to manufacture the device. A small shop will be equipped for finishing and assembling finished parts.

The Black River Falls Box & Mfg. Co., Black River Falls, Wis., has been organized with a capital stock of $100,000 by J. S. Thompson, proprietor of the former Badger Box & Lumber Co., Grand Rapids, Wis., whose plant was destroyed by fire late last fall. A new factory costing about $35,000 with machinery will be built at Black River Falls. Ground will be broken about May 5. Mr. Thompson is vice-president and general manager of the new concern.

The Board of Education, Bloomer, Wis., has engaged Carl Volkman, architect, Eau Claire, Wis., to prepare plans for a new high school and vocational training institute to cost about $85,000.

The Dauber-Kratsch Machine Co., Oshkosh, Wis., has completed a demonstrating model of a quadruple drive tractor designed by D. S. Stewart, formerly of Clintonville, Wis., and to be manufactured in quantities under the direction of the Antigo Tractor Syndicate, Antigo, Wis. The company is negotiating for the establishment of a permanent factory, but probably will not be ready to announce details until after June 1 or 15. William H. Wolpert, Antigo, is president.

The Badger Corrugating Co., LaCrosse, Wis., has awarded the general contract to Doty & Klick, local, for rebuilding and enlarging a factory, 120 x 200 ft., acquired a short time ago. The improvements will cost about $20,000, not including new machinery and equipment. This will become the main factory of the Badger company, which will continue to occupy its present plant largely as warehouse, stock room, shipping room, etc.

The Board of Education, Merrillan, Jackson county, Wis., will build a new high school in combination with a graded school and manual training and domestic science institute, the whole to cost about $100,000. Plans are being prepared by Parkinson & Dockendorff, architects, LaCrosse, Wis.

The Peat Products Co. of America, Milwaukee, has been incorporated with a capital stock of $250,000 to manufacture fuel and by-products from peat. The incorporators are C. A. Wayland, L. Sauer and Carl Cobb. Details of the company's program will be issued later.

The United States Tractor Co., a newly organized corporation, has purchased a nine-acre tract in Menasha, Wis., as a site for a plant.

Cincinnati

CINCINNATI, April 28.

Cablegrams have been received by machine-tool firms having representatives in England to the effect that the embargo on machine tools has been removed. No information is at hand as to whether this is but a temporary arrangement and no confirmation from the Government has been received. It is anticipated that this action will release some shipments which have been held up and will doubtless enable machine-tool makers to book other orders that have been under negotiation for some time past. So far no reports have been given out that France contemplates removing shipping restrictions, but a considerable number of machine tools are going forward to that country through the special permit system. Inquiries from Spain are increasing, but most of them are looked on as merely attempts on the part of importers to obtain selling agencies. Some bona fide inquiries from Japan for portable electric tools are being worked on, and within the past month quite a number of machine tools have been sold for shipment to that country.

Domestic business is quiet, although automobile makers are placing orders from time to time that enable some shops to continue operations without being compelled to stock many machines. Railroad buying is almost non-existent, with the exception of a single tool ordered now and then. Considerable speculation is made as to what the Government will do with the machine tools it has on hand in plants all over the country and a decision on this matter would be welcomed by all manufacturers.

The Baldwin Piano Co., Cincinnati, has acquired a five-story building at Third and Eggleston streets which will be remodeled and equipment installed for the manufacture of pianos. The main plant is on Gilbert Avenue.

The Miami Mfg. Co., Dayton, has been incorporated with $50,000 capital stock by B. G. Semmelman and others and will continue the manufacture of small machinery and machine parts. It was formerly conducted under a partnership.

The Die Products Mfg. Co., Dayton, has been incorporated with $10,000 capital stock to manufacture jigs, dies and small machine parts. Charles A. Lewis is the principal incorporator.

The Telle Belle-Vernon Co., Columbus, Ohio, will build an addition to its plant on Town Street and will install some refrigerating equipment.

The Kelly-Springfield Motor Truck Co., Springfield, Ohio, has announced that it will make some additions to its plant at an early date.

The West Virginia Car Mfg. Co. has plans under way for establishing a plant at Ironton, Ohio. M. E. Brown, Huntington, W. Va., is one of the principal officers in the company.

The Moore Tool Mfg. Co., Newark, Ohio, is equipping a plant in West Newark or the manufacture of machine tools. The company was formerly located in Indianapolis and is removing its equipment to the new location.

It is reported that the Central Refractories Co., Newark, whose capital stock was recently increased to $1,500,000, has tentative plans under way for establishing an additional plant.

The Mansfield Sheet & Tin Plate Co., Mansfield, Ohio, is considering doubling the capacity of its plant.

The Madison Tile Co., London, Ohio, has been incorporated with $60,000 capital stock by Reed Christman, H. B. Welsh and others. It formerly operated under a partnership arrangement. Additions to the plant are contemplated that include two large kilns.

The Dayton Malleable Iron Co., Dayton, Ohio, is considering erecting an addition to its plant at Ironton, Ohio.

Chicago

CHICAGO, April 28.

The reductions in lathe prices recently made by several large manufacturers have been followed by other price readjustments, among them a reduction of 10 per cent in the price of radial drills, cuts ranging from 10 to 20 per cent on a number of milling machines, about 15 per cent by an upright drill manufacturer, and approximately 20 per cent by certain makers of cutter and tool grinders. Insufficient time has elapsed to ascertain the effect of these prices on business.

The demand for tools continues at a fair rate. The tractor industry is still a prominent buyer, as are automobile and agricultural implement manufacturers. In general, purchasers include a wide range of industries, a condition which is attributed to the necessary readjustment incident to the transition from war to peace conditions. Plants which have been engaged in special war work are now buying equipment to fit them for a resumption of the manufacture of their regular products. This demand is for a great variety of tools rather than for any particular type. Illustrative of business resulting from the readjustment to peace conditions are recent purchases by a printing press manufacturer who had been engaged in munition work exclusively for over a year.

While deliveries in general are good, boring mills are difficult to obtain promptly, which, it is said, is due to relatively heavy purchases of this type of machine. Indicative of the activity in this field is that the output of boring mills by one maker in the first three months of this year exceeded that for the same period in 1918.

The Western Electric Co. continues to purchase various tools to replace the equipment being shipped to the Antwerp branch. No new lists are out except a small one issued by a local interest, calling for about $15,000 worth of machines.

Madge & Co., manufacturers of railroad supplies, 80 East Jackson Boulevard, Chicago, have awarded contracts for the erection of a one-story factory, 190 x 194 ft., at 4421-429 West Sixteenth Street. The building will cost about $75,000.

The Haegele Ice Co., 1501 Fleetwood Avenue, Chicago, has awarded contracts for the erection of a one and two-story ice manufacturing plant, 70 x 200 ft., at 1804 Devon Avenue, to cost $35,000.

The Jefferson Ice Co., 4306-10 Montrose Boulevard, Chicago, will erect a one-story ice manufacturing plant, 70 x 140 ft., at the same address, and another 26 x 50 ft. and 31 x 59 ft. at 515-521 Bickerdike Street. The total cost will be $30,000.

The car shops of the Atchison, Topeka & Santa Fe Railroad, Thirty-fifth Street and Kedzie Avenue, Chicago, were damaged by fire April 21. The loss aggregated about $40,000.

The Stover Mfg. & Engine Co., Freeport, Ill., plans to build an addition to cost $100,000 this year.

The Pana Engine & Machine Co., Pana, Ill., has incorporated with a capital stock of $60,000 to manufacture steam engines and operate a general machine shop.

The Curtiss Northwest Airplane Co., Minneapolis, has incorporated with a capital stock of $50,500 to manufacture airplanes and hydroplanes. The incorporators include J. M. Bickel and Paton MacGilvary, New York, and W. A. Kidder and G. A. Brooks, Minneapolis.

The Thermo Food Container Co. is making a survey of Minneapolis, St. Paul and adjacent towns for a factory site. The company was organized with a capital stock of $50,000 in January. F. B. Merrill, Stillwater, Minn., is president and E. G. Potter, Minneapolis, vice-president.

The Kroeschell Brothers Ice Making Co., 472 West Erie Street, Chicago, has arranged for the immediate erection of a new one-story machine shop, 73 x 80 ft., at 850-56 North Spaulding Street, to cost $10,000.

The American Automatic Products Co., Chicago, has been incorporated with a capital of $1,000,000 by M. Havlick, James H. McFarland and Frank Schoenfeld to manufacture automatic mechanical devices.

The Collins Rotary Safety Razor Co., 38 South Dearborn Street, Chicago, has awarded a contract to the Mueller Construction Co., 179 West Washington Street, for the erection of a new two-story plant, 150 x 200 ft., on West Lake Street, to cost about $80,000.

The Imperial Brass Mfg. Co., Chicago, has increased its capital to $750,000.

The Bureau of Aircraft Production, Washington, has leased a three-story mill building, 100 x 150 ft., at Forty-eighth Street and Maplewood Avenue, for aircraft work.

Frederick Wittenmeier, 815 North Spaulding Avenue, Chicago, will build a new one-story machine shop, 73 x80 ft., to cost $10,000.

Darrow & Moore, Champaign, Ill., will build a one-story addition 36 x 100 ft., to be equipped as a tin and metal-working shop.

The Depue Brothers Mfg. Co., Clinton, Iowa, manufacturer of tractors, is planning for the erection of a one-story, brick and steel addition, 90 x 250 ft.

The Blackhawk Tire Co., 919 Locust Street, Des Moines, Iowa, is completing plans for the erection of a two-story and basement structure, 66 x 150 ft., at East Twentieth and Grand streets, to cost about $60,000.

The Iowa Steel & Iron Works, Cedar Rapids, Iowa, will build a one-story foundry extension, 40 x 80 ft., for the production of castings.

The Board of Trustees, Water and Light Department, Hibbing, Minn., will soon commence the erection of a new municipal electric light and power plant, 100 x 150 ft.

Catalogs Wanted

The Winslow Boiler & Engineering Co., 1423 McCormick Building, Chicago, is working out plans for production and standardization and will be pleased to receive catalogs and literature for its commercial library from manufacturers of steam boilers and superheaters, oil-burning apparatus, steam engines, apparatus for burning pulverized coal, steam valves, and fittings for high pressures and temperatures, chassis parts for automotive vehicles, machinery and shop tool equipment. The company is about ready to put into production a new model steamobile truck. Its factory is at 530 Northwestern Avenue, Chicago.

St. Louis

ST. LOUIS, April 28.

The Illinois Glass Co., Alton, Ill., is considering the installation of ash handling machinery to handle 120 tons daily in connection with its glass plant.

The Standard Oil Co., in connection with plans for its Wood River plant at Wood River, Ill., and a new plant at Carlinville, Ill., contemplates the utilization of coal handling machinery of 500 tons daily capacity.

Swift & Co., Chicago, will install additional power plant capacity at St. Joseph, Mo., including two 500 hp. boilers, boiler feed pumps, chain grate stokers, etc.

The Farmers' Meat Packing & Cold Storage Co., Greenwood, Miss., will add about $50,000 worth of cold storage equipment to its present plant.

A cotton compress with equipment to cost about $60,000 is to be established at Batesville, Ark. The Young Men's Chamber of Commerce can be addressed.

The Marianna Cotton Oil Co., Marianna, Ark., C. P. Reed of the Cotton Seed Products Co., Louisville, Ky., president, plans the addition of $25,000 worth of machinery to plants at Marianna and Rondo, Ark.

The Public Service Gin & Elevator Co., Kiowa, Okla., H. G. Hancock, president, will install equipment to cost about $28,000.

The Arkansas Light & Power Co., Pine Bluffs, Ark., will equip an electric plant at DeWitt, Ark.

The City Council, Springdale, Ark., will equip an electric light and power plant requiring about $50,000 worth of machinery. W. L. Winters, Fort Smith, Ark., is engineer.

The City Commissioners, Clarksdale, Miss., will expend about $300,000 in reconstructing and improving its electric light and power plant.

The City Council, Lexington, Miss., will buy about $40,000 worth of electric light plant equipment for its new station.

The University of Missouri, Columbia, Mo., will add about $20,000 worth of equipment to its power plant. Address A. Ross Hill, president.

The City Council, Sikeston, Mo., will erect and equip an electric light and power plant to cost about $75,000.

The St. Joseph Street Railway, Heat, Light & Power Co., St. Joseph, Mo., plans improvements in its plant equipment to cost about $1,000,000.

The city of Duncan, Okla., will install about $33,000 worth of electric power plant equipment. The Benham Engineering Co., Oklahoma City, Okla., is in charge.

The city of Newkirk, Okla., will receive bids until May 20 for rebuilding its electric light and waterworks plant. Two motors and three oil engines are among the equipment needed.

The New Orleans Petroleum Co., Woolworth Building,

New York, will equip an oil refinery at New Orleans to cost about $1,500,000. Turbine generators are among the equipment to be used.

The W. G. Strange Oil & Refinery Co., Shreveport, La., capital $1,000,000, has been incorporated to erect a refinery. W. G. Strange, Newlin, La., is president.

The city of Okmulgee, Okla., will install a garbage disposal plant at a cost of about $20,000 for the initial trial unit.

The Fort Smith Coffee Co., Fort Smith, Ark., will open bids July 1 for about $20,000 worth of coffee roasting machinery and about $20,000 worth of cold storage equipment.

The Mineral Refining & Chemical Corporation, St. Louis, Mo., A. F. Versen, engineer, will equip an addition to its plant to cost about $500,000.

The City Council, Plattsburg, Mo., will install three pumps, three motors and other equipment in connection with its waterworks plant. E. E. Harper, Kansas City, Mo., is engineer.

R. L. Bradley, Hattiesburg, Miss., and associates are considering plans for the establishment of a local plant for the manufacture of cultivators and other agricultural machinery.

Indianapolis

INDIANAPOLIS, April 28.

The Western Drop Forge Co., Marion, Ind., has been reorganized with a capital stock of $1,500,000. The present plant will be enlarged and ultimately another unit will be built. Three hundred men are now employed and the number will be increased to 400 in a few weeks and later to 600. The directors are Gus S. Condo, John R. Browne, R. G. Brusch, Louis F. DeWolf and Jesse Wimmer.

The Chamber of Commerce, Connersville, Ind., recommends the organization of a company with $60,000 capital stock to provide building and equipment for the Perrysville Foundry Co., which will shortly move to Crawfordsville. It is estimated the building will cost $20,000, equipment $10,000 and $30,000 will be reserved for working capital.

The Capital Furniture & Mfg. Co., Noblesville, Ind., will make improvements to its plant, to cost $50,000, and has bought the H. M. Taylor lumber yard and planing mill adjoining its property. Three buildings will be erected and the force increased from 150 to 300 men.

It is reported from South Bend, Ind., that the Ford Motor Co., Detroit, has bought the Muessel field of 67 acres, and will build a factory to manufacture low-priced automobiles.

The Standard Woodworking Co., Lafayette, Ind., has been incorporated with $10,000 capital stock. The directors are George L. Potter, George Klotzenbucker and Carl C. Siegler.

The Computing Visible Measure Pump Co., Indianapolis, has been incorporated with $20,000 capital stock to manufacture measuring pumps. The directors are Frank L. Godby, James H. McConnell and Russell T. MacFall.

The G. I. Sellers Kitchen Cabinet Co., Elmwood, Ind., announces the organization of the G. I. Sellers Kitchen Cabinet Co. of Canada, which will establish a factory at Southampton. The Elwood plant will be enlarged by a four-story addition and the capacity increased from 60,000 cabinets a year to 100,000.

The Builders Supply Mfg. Co., Terre Haute, Ind., has increased its capital stock from $50,000 to $75,000.

The Batesville Lumber & Veneer Co., Batesville, Ind., will build a mill at Lawrenceburg, Ind., 40 x 300 ft.

The Fort Wayne Elevator Works, Fort Wayne, Ind., has increased its capital stock from $15,000 to $30,000.

The Humidity Control Co., Indianapolis, has been incorporated with $20,000 capital stock to manufacture systems for air control. The directors are Ira A. Minnick, Arthur E. Krick and George M. Corbaley.

The Keystone Foundry Co., Plymouth, Ind., has been incorporated with $10,000 capital stock. The directors are John E. Fogarty, George Pohl and D. P. Fogarty.

The Power Supply Co., Terre Haute, Ind., has increased its capital stock from $60,000 to $120,000.

The Hammond Optical Machine Co., Vincennes, Ind., has issued $20,000 of preferred stock.

The Ohio River Hub Co., Corydon, Ind., has been incorporated with a capital of $10,000 by Simon E. Grimes, Ivan R. Eckart and Milton W. Bean, to manufacture axles, hubs, etc.

The Haynes Automobile Co., Kokomo, Ind., is taking bids for the erection of the proposed new brick and concrete addition to its works, to consist of a four-story and basement structure, 150 x 500 ft.

Texas

AUSTIN, April 26.

The State Refining Association, Dallas, has purchased a site at Dublin for a proposed oil refinery which will have a daily capacity of 1500 bbl. The principal office of the association is in Dallas.

It is announced by the Department of Industry and Commerce of the Mexican Government that it has before it a proposition by private interests to construct three water storage dams on the Conchos River in the State of Chihuahua and the installation of a hydroelectric plant to generate about 100,000 hp. The project also involves the construction of a system of power transmission lines. The Mexican Northern Power Co. has a large dam and hydroelectric plant on the Conchos River practically finished. The new proposition is said to be separate and distinct from that of the Mexican Northern Power Co.

The electric light and power plant and the waterworks plant of the American Public Service Corporation, Abilene, which were recently destroyed by fire, will be rebuilt as soon as machinery and material can be obtained. The new plants will cost about $300,000.

The Duncan Oil & Refinery Co., Ranger, will construct an oil refinery at that place to cost about $250,000. T. W. Duncan is head of the company.

The Compania Irrigadora de Rio Bravo, State of Tamaulipas, Mexico, has been reorganized and will resume the construction of an irrigation plant and canal system for reclaiming about 200,000 acres. The pumping plant will be located on the San Juan River.

The Brown Syndicate, San Antonio, has awarded the contract to Mattes Brothers, Joplin, Mo., for the construction of a natural gas pipe line from the producing wells near Three Rivers to San Antonio.

The Moore Iron Works, 1600 East Missouri Street, El Paso, is planning for the erection of an addition to its plant, 60 x 100 ft., for the manufacture of portable steel garages and for assembling operations. The company has acquired the plant of the Moore-Schillinger Co., including machinery and equipment, and will use the property for extensions. It specializes in structural and ornamental steel and iron work, wire work, etc. F. B. Moore is president and manager.

The Liberty Refining Co., Cisco, is planning for the erection of an addition to its refining plant to increase the capacity from 1000 to 2000 bbl. per day. A new pipe line from the oil fields to Cisco is also planned, with pumping plants, etc., for an aggregate capacity of 8000 bbl. per day. George Ames is president.

The Weatherford Refining Co., Weatherford, recently incorporated with a capital of $100,000, has acquired about 12 acres and plans for the erection of a new oil refining plant with initial capacity of about 2000 bbl. of oil per day. E. A. Frantz is president, and G. A. Holland, secretary-treasurer.

The Davis-George Mfg. Co., Houston, Tex., recently incorporated, is planning for the operation of a plant for the manufacture of sheet metal products. The initial structure will be 84 x 150 ft., and with equipment is estimated to cost about $30,000. F. G. Davis is president and S. W. George vice-president.

California

LOS ANGELES, April 22.

Considerable electrical and mechanical equipment, packing machinery, conveyor systems, etc., will be installed in the new plant to be erected by the California Associated Raisin Co., Fresno, Cal. The entire work is estimated to cost $750,000. W. M. Giffen is president.

The National Carburetor Co., Los Angeles, has been incorporated with a capital of $25,000 by Charles L. Haskell, E. W. Degner and Charles F. Degner to manufacture carburetors and other equipment.

A machine shop and repair works will be installed in the new automobile building to be erected bp W. L. Maghee, Ventura, on Main Street. The structure will be one-story, 75 x 170 ft., with wing, 50 x 60 ft., and is estimated to cost $17,500.

The Yellow Pine Mining Co., San Bernardino, Cal., is planning for the erection of a new electric power plant, replacing the structure recently destroyed by fire.

The Hanford Iron Works, San Bernardino, Cal., has filed plans for the construction of an extension to its foundry.

The Standard Steel Automotive Co., Los Angeles, has been incorporated with a capital of $50,000 by Charles P. and B. C. Vauclain and Glenn R. Keith to manufacture mechanical devices and equipment.

The Parker Machine Shop, 620 North Main Street, Los Angeles, has filed notice of organization to manufacture ma-

entire parts, engage in repair work, etc. William Parker, 1114 Bellevue Avenue, heads the company.

The Southern California Edison Co., Los Angeles, is perfecting plans for the inauguration of work on the proposed new hydroelectric power plant on the upper Kern River, near Bakersfield, Cal. It is estimated that the entire project will require about 24 months for completion and will cost in excess of $10,000,000.

The John D. Hoff Asbestos Co., San Francisco, is planning for the establishment of a branch plant at San Diego, for the manufacture of asbestos-magnesite floors and other specialties.

The Progressive Engineering Co., Los Angeles, has been incorporated in Delaware with capital of $25,000 by C. A. Campbell, F. A. Whitney, Los Angeles; and F. P. Sperry, Sierra Madre, Cal., to manufacture a patented threading and tapping machine device.

The California Pipe & Supply Co., 1604 Santa Fe Avenue, Los Angeles, has been organized to manufacture pipe and similar specialties. W. G. Leahy, 1308 West Eighty-ninth Street, and A. E. Lyon, 920 West Forty-ninth Street, head the company.

The Pan-American Petroleum Co., Los Angeles, has awarded contract to the J. Alden Griffin Construction Co., Los Angeles, for the erection of its new refining plant at Vernon on a 10 acre tract which it recently purchased. T. D. Boone is engineer.

The Central South

LOUISVILLE, April 28.

The A. G. Perry Plow Co., Coldwater, Miss., is arranging for the erection of a plant at Memphis, Tenn., for the manufacture of plows and other agricultural equipment.

The Tennessee River Power Co., Chattanooga, Tenn., is planning to rebuild its electric power station on Carter Street, recently damaged by fire.

The Coalfield Coal Co., Knoxville, Tenn., is planning for the rebuilding of its tipple and mining works recently destroyed by fire. C. W. Henderson is treasurer.

The Sanitary Fountain & Cooler Co., Owensboro, Ky., manufacturer of cooling equipment, fountains, etc., has increased its capital from $50,000 to $75,000.

A. B. Smith and others, Paducah, Ky., are in the market for a steam skidder for use in clearing off 8000 acres of cut over lands in Dyer, Tenn.

F. R. McGrath and Albert Suppinger, who recently acquired the Capital Lumber Co., will install steam power and remodel the plant.

The Atlas Coal Co., Louisville, is installing an additional coal hopper to its elevator and will require conveying equipment and motor.

The Ignition Plug Co., Dayton, Ohio, capital $50,000, has leased property at Fourteenth Street and Broadway, Louisville, where it will establish a plant to machine and assemble spark plugs.

The Pacific Northwest

SEATTLE, April 22.

General business is showing a slow but steady improvement, with demand for equipment fairly active.

Marked improvement in the unemployment situation is shown in Seattle and other Northwestern cities, which is largely due to demands from the shipyards and the call for farm and road workers.

The Gerber Machinery Co., Portland, will construct a one-story factory for making fenders and bodies for automobiles.

St. Helens Shipbuilding Co., St. Helens, Ore., will build a drydock to cost $200,000.

The Astoria Marine Iron Works, Astoria, Ore., plans the construction of a marine railroad to cost about $500,000, authorized some time ago by the Emergency Shipping Board. All equipment will be electrically operated.

The Patterson-MacDonald Shipbuilding Co., Seattle, plans to convert its wooden shipbuilding yard on Duwamish Waterway into a plant for construction of steel vessels. It is equipped with four ways. A. M. MacDonald, general manager, announces that several contracts for steel ships have been secured from foreign interests.

The Western Rubber Co., Tacoma, has purchased a site on which will be erected a plant for the manufacture of tires and other rubber products. Elmer Dover is president.

The Pleasant Northwest Products Co., Salem, Ore., will erect a brick boiler house to cost about $6,000.

The plant of the Hill Logging Co., Bunker, Wash., was completely destroyed by fire recently with loss of $100,000. It will probably be rebuilt. C. O. Hill, Z. F. Adams and L. A. Lewis, Portland, owners.

The plant of the Tacoma Foundry & Machine Co., Tacoma, Wash., was completely destroyed in a recent fire with loss of $40,000. John Taylor is president.

The plant of the Beaver River Lumber Co., Westminster, B. C., was destroyed in a recent fire with a loss of $80,000.

The Northwest Ice Machinery Co., Seattle, will occupy a new structure at 1308 Seattle Boulevard, 60 x 90 ft., which will be equipped with new machinery.

The Commission of the port of Astoria, Ore., has authorized improved dockage facilities aggregating $900,000. The equipment includes loading machinery, cranes, railroad tracks, switching engine, etc.

The Astoria Paper Co. is expending $250,000 on new machinery and general improvements.

The Island Lumber Co., St. Helens, Ore., will build a sawmill on Sauvies Island with a daily capacity of 60,000 ft.

It is stated on the authority of the Chamber of Commerce that the Horne Mfg. Co., Brooklyn, will locate a factory for the manufacture of marine electrical equipment in Seattle in the immediate future.

Government Purchases

WASHINGTON, D. C., April 28.

Bids will be received by the Bureau of Supplies and Accounts, Navy Department, Washington, until May 9, schedule 3934, for four 16-in. x 8-ft. belt-driven engine lathes, for Brooklyn.

Large Company at Birmingham, Eng., Absorbed by Vickers, Ltd.

WASHINGTON, April 29.—The American Consul General at London has sent to the Bureau of Foreign and Domestic Commerce a report that the engineering firm of Vickers (Ltd.) is to acquire by purchase the whole capital of the Metropolitan Carriage, Wagon & Finance Co. (Ltd.), of Birmingham. The importance of this deal may be gathered from the fact that the latter concern has an authorized capital of over $51,098,250, of which nearly $17,032,750 is issued, valued in the market at $70,564,250, and it is the largest company of its kind in the United Kingdom; for the 11 years to 1917-18 the ordinary shares received 15 per cent each year, and in 1912 and 1917 bonuses of 50 per cent and 100 per cent were distributed in shares. Vickers (Ltd.) has an issued share capital of nearly $43,798,500, of which $36,489,750 consists of ordinary shares; and an interim dividend of 7½ per cent has been paid for 1918 on the ordinary shares. In 1917 and the preceding four years, 12½ per cent was paid, while previously there were five years of 10 per cent, and earlier thereto 15 per cent was maintained for some years. As is known, Vickers operations are world-wide; their works and interests are situated in Sheffield, Barrow, Birmingham, Erith, Dartford, Crayford, Ipswich, as well as in Canada, Italy, Japan, Spain and Russia. In 1897 this firm acquired the Naval Construction & Armaments Co. and the Maxim-Nordenfeldt Guns & Ammunition Co. In 1902 it purchased practically half the ordinary capital of $7,299,500 of William Beardmore & Co., the Glasgow engineering firm. It is also owner of the share capital of the Wolseley Motors and the Electric & Ordnance Accessories Co., the former of which, it may be added, is rapidly restoring its works from war manufacturing equipment to automobile construction on a large and improved scale. The present market value of Vickers' ordinary shares is over $72,995,000.

The New York Shipbuilding Corporation, Camden, N. J., is distributing the first number of the "York Ship News," dated April 15, issued in the interest of the employees of the corporation and under the supervision of the industrial service department. The cover page shows a view of the Idaho as it appeared from the roof of the wet dock. Contents include a service record of numerous ships with illustrations that have been constructed at the yard, including the steamship Tuckahoe, the 27-day boat.

Current Metal Prices

On Small Lots, from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience.

On a number of articles the base price only is given, it being impossible to name every size.

The wholesale prices at which large lots are sold by manufacturers for direct shipment from mills are given in the market reports appearing in a preceding part of THE IRON AGE under the general headings "Iron and Steel Markets" and "Metal Markets."

Iron and Soft Steel Bars and Shapes

	Per lb.
Bars:	
Refined iron, base price	3.37c
Burden's H. B. & S. bar iron, base price	6.30c
Burden's best bar iron, base price	6.50c
Swedish bars, base price	20.00c
Soft Steel:	
¾ to 1⅞ in., round and square	3.37c
1 to 6 in. x ⅜ to 1 in.	3.37c
1 to 6 in. x ¼ and 5/16	3.47c
Rods—⅝ and 11/16	3.42c
Bands—1½ to 6 x 3/16 to No. 8	4.07c
Shapes:	
Beams and channels—3 to 15 in.	3.47c
Angles:	
3 in. x ¼ in. and larger	3.47c
3 in. x 3/16 and ⅛ in.	3.72c
1½ to 2½ in. x ⅛ in.	3.52c
1½ x 2¾ in. x 3/16 in. and thicker	3.47c
1 to 1¼ in. x 3/16 in.	3.52c
1 to 1¼ in. x ⅛ in.	3.57c
⅞ x ⅞ x ⅛ in.	3.62c
¾ x ⅛ in.	3.67c
⅝ x ⅛ in.	4.47c
½ x 3/32 in.	5.17c
Tees:	
1 x ⅛ in.	3.87c
1¼ in. x 1¼ x 3/16 in.	3.77c
1½ to 2½ x ¼ in.	3.57c
1½ to 2½ x 3/16 in.	3.57c
3 in. and larger	3.52c

Merchant Steel

	Per lb.
Tire, 1½ x ½ in. and larger	3.37c
Toe calk, ½ x ⅝ in. and larger	4.72c
Open-hearth spring steel	6.00c
Standard cast steel, base price	14.00c
Extra cast steel	18.00 to 20.00c
Special cast steel	23.00 to 25.00c

Tank Plates—Steel

	Per lb.
¼ in. and heavier	3.67c

Sheets

Blue Annealed

	Per lb.
No. 8 and 3/16 in.	4.52c
No. 10	4.57c
No. 12	4.62c
No. 14	4.67c
No. 16	4.77c

Box Annealed—Black

	Soft Steel C. R., One Pass, per lb.	Wood's Refined, per lb.
Nos. 18 to 20	5.17c	
Nos. 22 and 24	5.22c	6.95c
No. 26	5.27c	7.00c
No. 28*	5.37c	7.15c
No. 30	5.57c	

No. 28, 36 in. wide, 10c higher.

Wood's Keystone Hammered, 18-24 gage, 9¾c; 26-28 gage, 10¼c.

Galvanized

	Per lb.
No. 14	5.60c
No. 16	5.75c
Nos. 18 and 20	5.90c
Nos. 22 and 24	6.05c
No. 26	6.20c
No. 27	6.35c
No. 28	6.50c
No. 30	7.00c

No. 28, 36 in. wide, 20c. higher.

Corrugated Roofing, Galvanized

2½ in. corrugations, 10c. per 100 lb. over flat sheets.

Steel Wire

BASE PRICE* ON No. 9 GAGE AND COARSER

Bright basic	5.[illegible]
Annealed soft	5.[illegible]
Galvanized annealed	6.[illegible]
Coppered basic	6.[illegible]
Tinned soft bessemer	7.[illegible]

*Regular extras for lighter gages.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High Brass Sheet	20c to 21½
High Brass Wire	20c to 21½
Brass Rod	19c to 20½
Brass Tube	30¾c to 35c

Copper Sheets

Sheet copper, hot rolled, 16 oz., 22½c. to 25c. per lb. base.

Cold rolled, 14 oz. and heavier, 1c. per lb. advance over hot rolled.

Tin Plates

Bright Tin		Coke—14x20	
Grade "AAA" Charcoal 14x20	Grade "A" Charcoal 14x20		Primes	Wasters
		80 lb.	$8.30	$8.[illegible]
		90 lb.	8.40	8.[illegible]
		100 lb.	8.55	8.[illegible]
IC $11.30	$10.05	IC	8.80	8.[illegible]
IX 13.50	12.00	IX	10.00	9.[illegible]
IXX 15.25	13.75	IXX	10.95	10.[illegible]
IXXX 17.00	15.50	IXXX	11.90	11.[illegible]
IXXXX 18.75	17.25	IXXXX	12.85	12.[illegible]

Terne Plates

8-Lb. Coating 14x20

100 lb.	$8.[illegible]
IC	8.[illegible]
IX	9.[illegible]
Fire door stock	11.[illegible]

Tin

Straits pig	74c to 7[illegible]
Bar	85c to 9[illegible]
American pig, 99 per cent	70c to 7[illegible]

Copper

Lake Ingot	18c to 1[illegible]
Electrolytic	17c to 1[illegible]
Casting	16½c to 17[illegible]

Spelter and Sheet Zinc

Western spelter	8½c to 8[illegible]
Sheet zinc, No. 9 base, casks	12c; open [illegible]

Lead and Solder*

American pig lead	6½c to 6[illegible]
Bar lead	7½c to 8[illegible]
Solder ½ & ½ guaranteed	[illegible]
No. 1 solder	[illegible]
Refined solder	[illegible]

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	[illegible]
Commercial grade, per lb.	[illegible]

Antimony

Asiatic	8[illegible]

Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	37c to [illegible]

Old Metals

The market is unchanged. Dealers' buying prices nominally as follows:

	Cents Per Lb.
Copper, heavy and crucible	12[illegible]
Copper, heavy and wire	12[illegible]
Copper, light and bottoms	11[illegible]
Brass, heavy	8[illegible]
Brass, light	7[illegible]
Heavy machine composition	10[illegible]
No. 1 yellow rod brass turnings	10[illegible]
No. 1 red brass or composition turnings	11[illegible]
Lead, heavy	5[illegible]
Lead, tea	3[illegible]
Zinc	5[illegible]